OCTOBER 27, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Why I will vote

I believe in good government. I believe in honest government. I believe in efficient government. Especially do I believe in a solvent government. We do not have this kind of government because you and I have been remiss in our exercise of the voting franchise. Into the vacuum created by our carelessness have barged pressure blocs and demagogues. They virtually rule the nation. Their selfish objective is to take all the traffic will bear today and to hell with the consequences tomorrow. I will vote Nov. 4 to try to restore our federal government to one that is of all the people, by all the people and for all the people.

E. C. Shaner

EDITOR-IN-CHIEF

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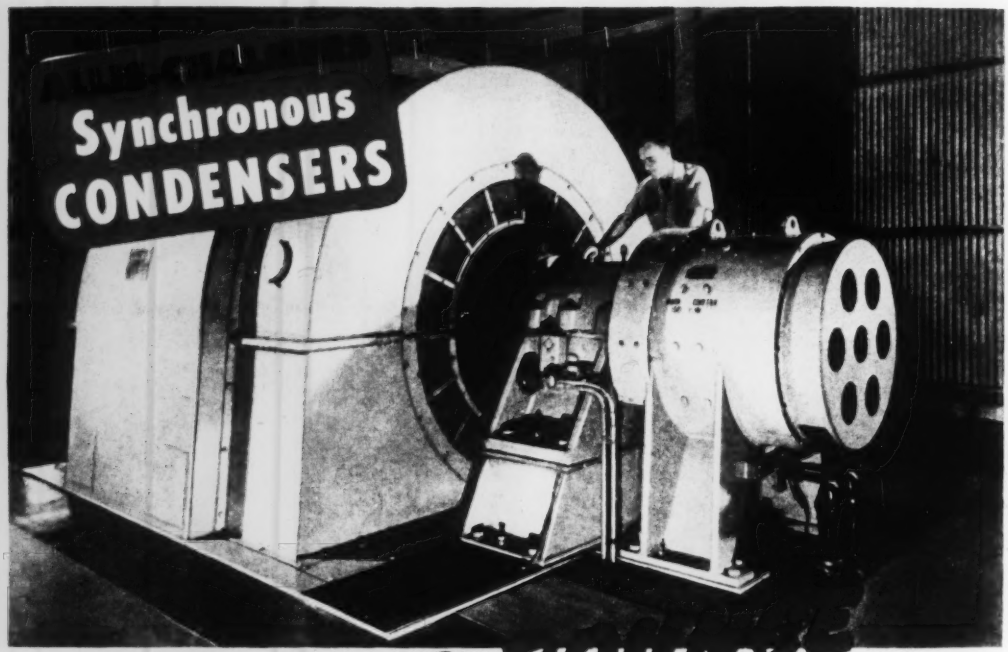
Mr. Shaner Continues His Election Comments on p. 39



FOR LESS BOUNCE TO THE ARC

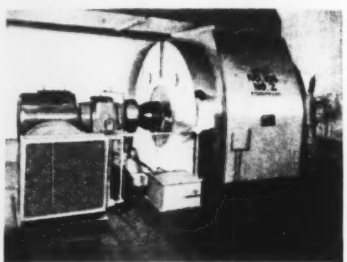
this low reactance condenser insulates power system from violent arc furnace load swings

RECENTLY INSTALLED in a southern steel plant, this 25,000-kva synchronous condenser was designed to solve a serious power supply problem. In adding a large arc furnace, the plant engineers had to keep the voltage disturbances from bouncing back into the local power system.

Short of producing their own power, they had a choice of three ways of doing this. They chose a synchronous condenser because it could do the job more economically and more reliably than a motor-generator set and could handle the violent kva fluctuations better than series capacitors.

With the condenser and furnace in parallel, a buffer reactor on the line insures adequate absorption of the arcing transients by the condenser. And pilot excitation from a *Regulex* control provides high speed response to the reactive kva swings of the furnace.

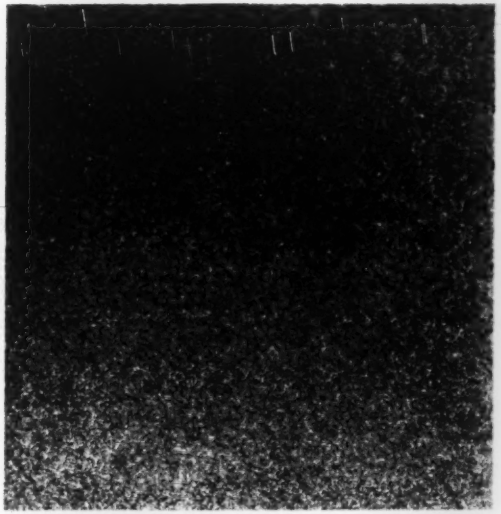
If you need a special condenser or one for power factor correction, Allis-Chalmers can supply a unit engineered to your requirements. For construction features, ratings and standards, ask your A-C representative for Bulletin 05B7285. Or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A 3853



One of two units installed for power factor correction in a large Ohio steel plant, this 20,000-kva synchronous condenser paid for itself within a short period of time

Regulex is an Allis-Chalmers trademark.

ALLIS-CHALMERS



When plain carbon steel is exposed to the atmosphere, it begins to oxidize almost immediately and a layer of rust forms over the surface. After a brief period this rust has a tendency to curl up and flake off, leaving the metal exposed to further corrosive action.

Corrosion also takes place when Mayari R is exposed to the atmosphere. But the rust is different. Instead of flaking, it forms a thin, tight coating that holds securely to the surface and retards further corrosion of the metal beneath. And this in turn means longer life for Mayari R.

Why Mayari R Has Longer Life than Plain Carbon Steel

Tests conducted over a 10-year period show that Mayari R has 5 to 6 times as much resistance to atmospheric corrosion as plain carbon steel—and 2 to 4 times as much as copper-bearing steel.

During the first year of exposure under these tests, each of these three metals lost practically the same amount of weight through corrosion. But following that initial loss, the corrosion of the Mayari R gradually slowed down. After a few years it appeared to stop altogether. The plain carbon steel and the copper-bearing steel, on the other hand, continued to rust away and lose weight year after year, with practically no decrease in the rate of corrosion.

Mayari R has other advantages. It has better abrasion-resistance, higher yield point, and greater tensile strength than ordinary steel. These properties all contribute to improved design and longer life of equipment and structures.

You can get further information about Mayari R low-alloy, high-strength steel by writing to any of our sales offices for Catalog 259.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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Mayari R *makes it lighter... stronger... longer lasting*

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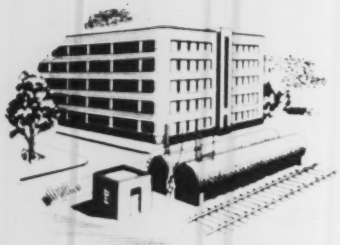
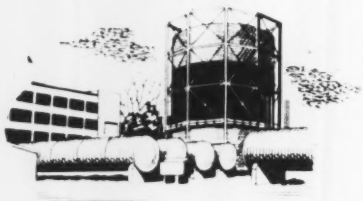
CLEAN, UNIFORM HEAT FOR INDUSTRIES *AND* UTILITIES





PHILGAS BENEFITS: This top-quality Phillips *66* butane-propane fuel is uniform in thermal value and gravity. Free from harmful contaminants, it burns *clean!* Automatic operation cuts down on overhead, assures constant furnace temperatures, atmospheres and pressures.

PHILGAS USES: Leading industries use Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many other operations. Many progressive utilities also find it advantageous to augment their natural or manufactured gas output with clean-burning, reliable Philgas.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas

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Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give 4x more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched.... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all."

"Ordinary belts lasted only 5 or 6 weeks.... B. F. Goodrich grommet belts are in their sixth month of service."

"Previous belts suffered from shock loads, wore out fast.... BFG grommet belts have been in service 2 years with no shut-downs...."

There are hundreds of cases like these.

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BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,235,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V-Belts BY

B.F.Goodrich

FIRST IN RUBBER

The B. F. Goodrich Company
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☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

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This Week in Metalworking

STEEL

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Behind the Scenes...

Hurray for Our Side

We got a letter from F. A. Bellamy, Henrite Products Corp., and he says that he always reads this page first to get in the mood for the rest of the paper.

We don't know how the editors upstairs feel about it, but we feel fine. We went right out and bought us a big fat cigar.

Cover Stuff

The story with the highlights in this week's issue is on the editorial page. After much drafting and rewriting this is Editor-in-Chief Shaner's considered opinion on why we should vote. It's a darn good opinion we think.

It's always a touchy proposition to remind someone about something he should know anyway. Also the subject of politics and government is a hot one since we're all experts in those fields.

Nevertheless, after reading this editorial (and many of the previous ones) no one should have any doubts as to Mr. Shaner's thoughts on both the subject and its importance.

Our Moniker

One of the editors was reading a book on semantics the other day on his own time. In the section on word meanings it told how the dictionary people take a batch of sentences using a word correctly and then derive a definition of the word. The following is a quotation from that section:

"If you were compiling a dictionary and had before you only the following quotations, what definition would you write for the word 'shrdlu'? Don't just try to find a one-word synonym but write out a ten to twenty word definition.

1. He was exceptionally skillful with a shrdlu.
2. He says he needs a shrdlu to shape the beams.
3. I saw Mr. Jenkins yesterday buying a new handle for his shrdlu.
4. The steel head of Jenkins' shrdlu was badly chipped.
5. Don't bother with a saw or an ax; a shrdlu will do the job faster and better."

Definition derived by our editor: A mallet-headed object especially for use and abuse; a bit dull but all in all a good head.

Thanks for the last anyway.

Low Man

The several recent extra-large issues and the contemplation of some coming up have begun to tell in wear and tear on some of the editors upstairs. Walt Campbell, for instance, had some trouble qualifying for a boy's game of keep-away touch football.

On his son's tenth birthday Walt took a group of the boys out to the park. When they decided to choose up sides for a game, young Campbell was the first one chosen. The last two were a small lad and Walt. One captain chose the diminutive boy; the other looked at Walt, hung his head and hesitated, and then said, "Oh, shoot."

Special Week

This will be another busy week for those of us who observe all "specials" religiously. This time it's National Flower Week, Honey Week and Radio and Television Week. We've thought of three different ways to tie these together, but we'd no doubt land in the clink for any one of them, so we'll let it ride the way it is.

Puzzle Corner

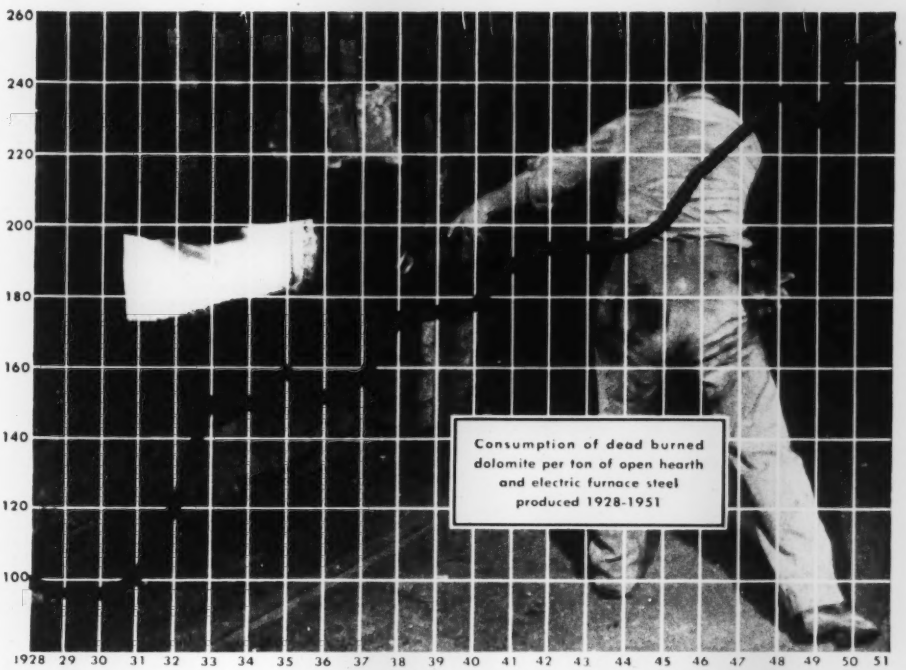
The answer to the puzzle in the 13th issue is: I am 9.6, sis is 16.8, Mother is 38.4 and Dad is 50.4 years old. First in with that one were L. D. Rice, Timken Roller Bearing Co. and P. Pozzi, American Flange & Mfg. Co. Inc., and R. E. Kirby, Westinghouse Electric Corp.

This week's puzzle is one we should all get. If you can't see your way clear on paper, just find a well and try it out.

In the bottom of a 20-ft well there was a frog who began climbing toward the top at the rate of 3 feet every day. Each night, however, he fell back 2 feet. In how many days did he get out?

Shrdlu

(Metalworking Outlook—Page 35)



raw dolomite vs. dead burned dolomite

RAW dolomite is without peer for routine "drying" of open hearth bottoms and is useful for banking doors and making up banks over the line. However, for bank and bottom maintenance, most operators have concluded that despite its low price raw dolomite is not a low cost refractory.

The difference in price between dead burned dolomite and raw dolomite is essentially a reflection of the difference in the amount of work performed on the two products by the supplier. The increase in refractory value exceeds the increase in price because of characteristics imparted to dead burned dolomite during processing.

To obtain the oxides of calcium and magnesium, the desired refractory constituents, dolomite must be calcined to drive off carbon dioxide amounting to about 50% of its weight. In the case of dead burned dolomite fuel for calcination is provided by the manufacturer, whereas with raw dolomite it is supplied by the steelmaker. The average lime kiln uses about 10,000,000 BTUs to produce a ton of calcined product. Thus in making a 200-ton heat, an open hearth using 100 pounds of raw dolomite per ton of steel, consumes enough fuel in calcination to refine 15 tons of steel!

Merely to get the same number of pounds of refractory oxides contained in a ton of dead burned dolomite requires handling about 2 tons of raw dolomite, with a like reduction in furnace capacity. However, substitution of raw dolomite on a 2 to 1 basis fails to recognize the vastly superior efficiency of dead burned dolomite as a maintenance refractory. The coalescing agent incorporated in dead burned dolomite during manufacture causes the refractory to *set fast and stay fast* at operating temperatures. Concurrently each grain is "shrunk" to about 17% of its original volume and sized to insure a well consolidated repair of maximum density and refractory oxide content.

In contrast raw dolomite calcines to high porosity and low density in the open hearth and in the absence of an integral bond sets erratically under the fluxing effect of slag soaked up from bank and bottom.

These are some of the factors that have dictated the steady 25-year swing to dead burned dolomite. During this period Basic Refractories' capacity for producing its dead burned dolomite products, Magnefer and Syndolag, has been expanded repeatedly to meet steelmakers' needs.

GRANULAR BASIC REFRACTORIES

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., *Hamilton and Montreal*

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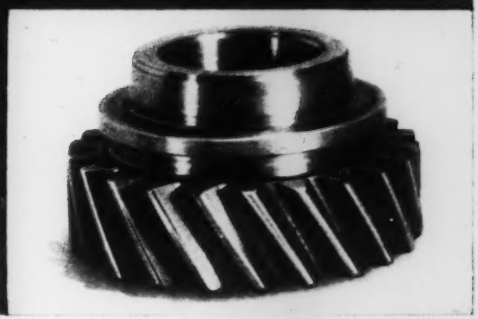
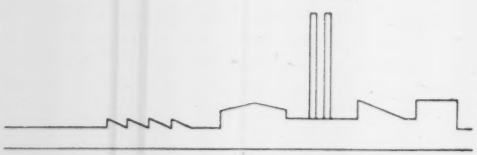
MICHIGAN TOOL Company



See next week's issue for announcement of STEEL 's "Program for Management"



LETTERS
TO THE EDITORS

Requests Continue To Come In

Reference is made to two articles in the Sept. 22 issue of STEEL. One is the excellent article on the Fairless Works of the U. S. Steel Co. (p. 121) and the other is the table on American steelmaking capacity (p. 146). I would like reprints of these articles for our files.

Stanley Nehmer
chief, iron & steel branch
Manufactured Products Staff
Office of International Materials Policy
Department of State
Washington

• *They're sent—ED.*

Sport Cars Ad Infinitum

Mr. K. G. Merrill (Letter to the Editor, Sept. 29, p. 10) to my mind has a point. In sport cars as in many another thing designers want appearance, not function—the shadow, not substance.

What remedies are there? Three: 1. Use the old car longer, 2. protest verbally on occasion, 3. buy Fiat, Renault, VW, Riley, Austin, MG, Ford Consul and Jaguar. I'm aware that only two of these are sport cars.

Why pay $6000 for an imitation sport car when the best of the real thing costs about $4000? Or half that for the less comfortable MG?

Theodore Kain
2002 Yorkshire Avenue
St. Paul

Never Misses Reading STEEL

This is to advise you that I do not think I have missed a copy of STEEL in the last twenty years. Two copies come to our office each Monday and we certainly make use of them.

R. H. Money
Universal Major Appliance Co.
Lima, O.

Package for Maine

Will you kindly furnish us with two reprints of the article "Wrap Up Savings in Scientific Packaging" (Oct. 6, p. 57).

R. J. Courtenay
manager of purchases
Saco-Lowell Shops
Biddeford, Me.

Sources of 'The Real Threat'

Would you please give me the source of the statistics on number of metalworking companies employing 20 or fewer persons in 1939 and 1950, which

Concluded on Following Page

In 1926 Heyl & Patterson built its first ore bridge for Weirton Steel Company. This bridge, now 26 years old, is still efficiently unloading, stocking and reclaiming ore for the Weirton blast furnaces.

1

In 1942 the second H & P ore bridge for Weirton Steel was put into operation. This bridge is essentially of the same dimensions and runs on the same tracks as the original bridge. It also includes extra sturdiness, more safety features, greater ease of control and provisions for lower maintenance.

2

3

In 1952 the third ore bridge was designed, fabricated and erected by Heyl & Patterson for Weirton Steel. Because of the efficient and successful performance of the first two H & P bridges through the years, this latest bridge is, by request, almost an exact duplicate of the bridge built in 1942.

ORE BRIDGES at WEIRTON STEEL COMPANY

The performance record of the three Ore Bridges at Weirton Steel Company, designed, fabricated and erected by Heyl and Patterson, illustrates the sturdiness, dependability and efficiency built into every piece of Heyl & Patterson Heavy Bulk Materials Handling Equipment. Heyl & Patterson has the experience, facilities and personnel to do THE WHOLE JOB . . . ALL THE WAY FROM DESIGN to ERECTION.

Heyl & Patterson, Inc.

"SINCE 1887"

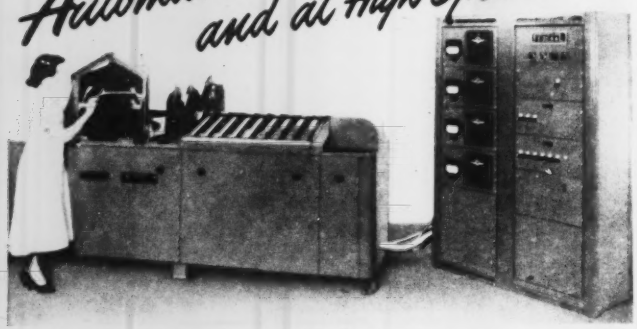
55 WATER STREET · PITTSBURGH 22, PA.

Heavy Bulk Materials Handling Equipment

All The Way from Design to Erection

Gage and Sort Precision Parts

Automatically and at High Speed

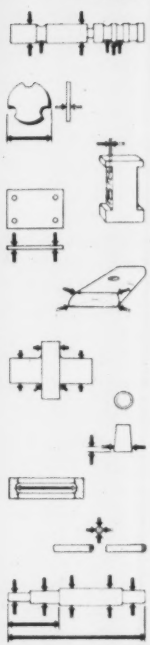


At a speed of 3,000 plus per hour this conveyor-fed multi-inspection gage measures and sorts piston pins for hardness, triangular out-of-round, taper and diameter along the full length of the workpiece. The pins are automatically sorted into ten disposal units: out-of-round, tolerance .00005"; taper, tolerance .0001"; hardness, O.K. and "bad"; diameter, five groups of .0001" difference, plus over and under.

The final inspection of mass-produced, similar parts is automatically accomplished by Federal Gaging and Sorting. Federal Automatic Gages reduce non-productive inspection time, effect substantial savings in subsequent assembly, and eliminate useless machining of outsized pieces finally discarded as scrap.

The speed of automatic gaging is limited only by the speed of mechanical handling of the workpieces. As for accuracy, extremely high magnifications can be provided (in millionths when necessary) or fairly low magnification and long range. Practically any dimension or several dimensions or dimensional conditions can be gaged by Federal Automatic Sorting Gages.

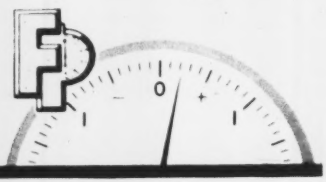
We have had extensive experience in the design and manufacture of high speed automatic and sorting gages and can recommend equipment to answer your particular needs. Write us for information on all types of automatic gages including multi-dimension, continuous measuring, machine control and automatic sorting gages. Federal Products Corporation, 1216 Eddy St., Providence 1, Rhode Island.



A few of the many dimensional inspections possible with automatic and sorting gages.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.



LETTERS

Concluded from preceding page

was quoted in the Editorial of STEEL. (Oct. 6, p. 43)?

I would be interested in obtaining this type of data for New England if a regional breakdown of these figures is available.

J. M. Sherman
Federal Reserve Bank of Boston
Boston

• *Statistics for 1939 were found in the "Census of Manufacturers" for 1939. Statistics for 1950 were found in "County Business Patterns, Part I, United States Summary, First Quarter, 1950", published by the Bureau of the Census. The regional breakdown you request can be found in "County Business Patterns, Part II, Geographical Divisions, No. 1, New England, Middle Atlantic".—ED.*

Successful Success Story

I want to tell you how pleased I am with your thorough and interesting presentation of the Gildemeister machine at Special Screw Products Co. (Oct. 6, p. 86). I particularly liked your lead, "They're doing an old job by a new method . . .". The new methods are making the big difference in keeping ahead of the break-even point.

Mack Lebiang
Mack Lebiang Co.
New York

Camera Caper

With reference to your article "You Make the Errors" (Oct. 6, p. 75), describing a new reflex camera, will you please give me any other information you may have on it, including where they may be purchased.

R. J. Sloan
Crouse-Hinds Co.
Syracuse, N. Y.

I would appreciate any further information you may have on the camera.

R. M. Obrist
302 Wilmore Place
Syracuse, N. Y.

. . . please forward the name of the producer or importer of the German camera referred to.

S. J. Gwosh
president
Excel Automatic Products, Inc.
Newark, N. J.

• *Write to Praktica Co. Inc., 48 West 29th Street, New York 1.—ED.*

Where Did the Steel Go?

I am on leave with the National Production Authority in Washington and will appreciate your sending me the following information:

Distribution of finished steel products by market classification in the last half of 1951 and/or the full year, 1951. Also, the first half of 1952.

Bernard J. Beck
Lafayette Hotel
Washington

• *Complete report for 1951 (Apr. 7, 1952, p. 96) has been sent. Reports for first half of 1952 have not yet been issued.—ED.*

The New Day's Dawning!

Plant Expansion Plant Modernization

A Progress Report on Monarch's Improved Lathe Production

Your Monarch lathe order may be closer to delivery than you think! Very soon, now, our expansion program will be completed—and every day output increases as we move new tools and production lines into each unit on the heels of construction crews.

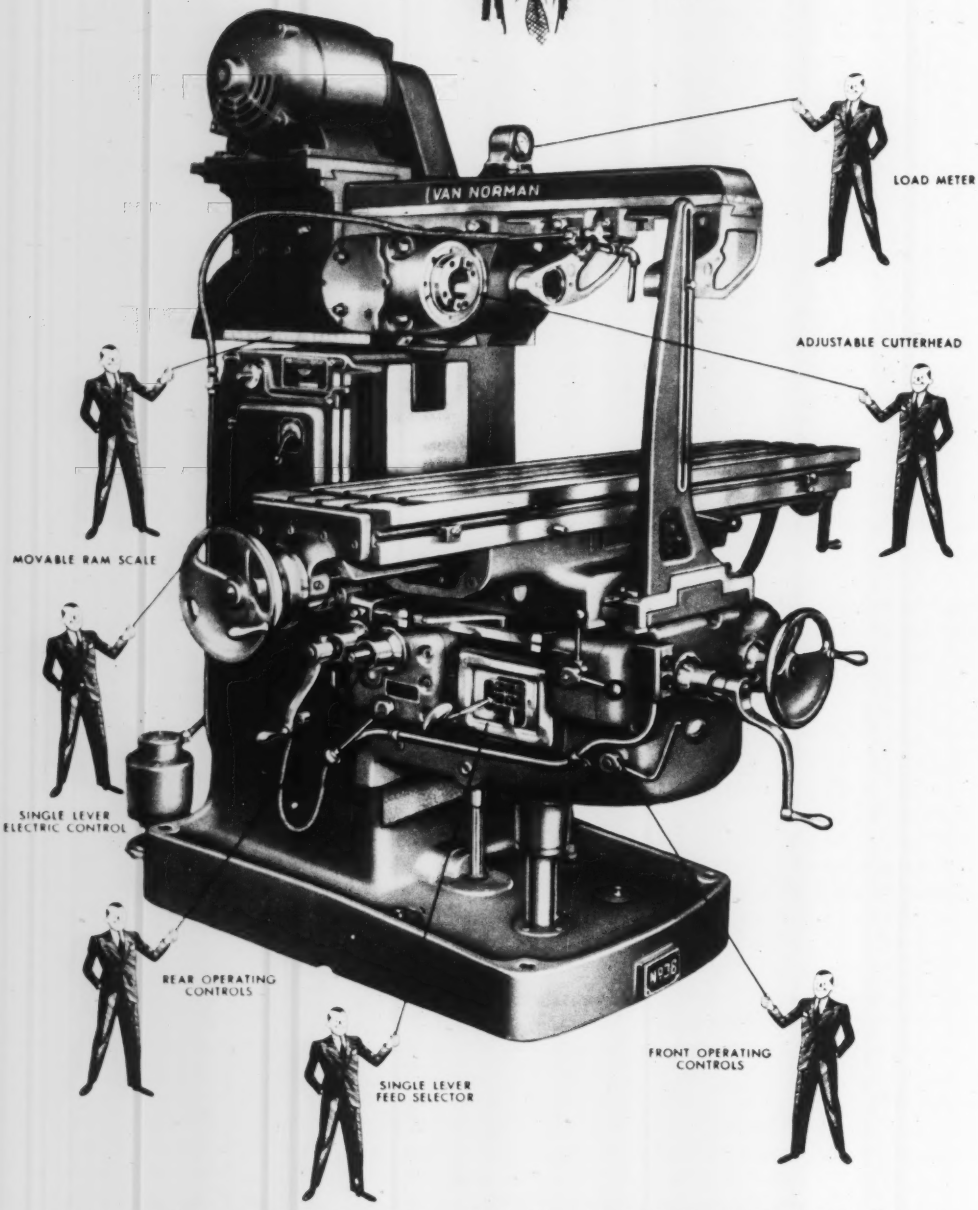
Monarch output for '52 will be about double that of '51, and the architect's rendering above largely explains this growth. Upon completion of our program, we will have added a whopping 43% to our floor space since the close of World War II, and completely modernized the 25% requiring it. Tool and equipment additions, of course, are in proportion. With a completely modernized plant plus this great an increase in floor space, you can see why we're confident of cutting into our backlog fast.

Every day, we're better able to handle new orders and to move faster on present orders—and there'll be continuous improvement with each day's operation. So hang on to your precious priority order. Let us have your new orders. Your new Monarchs are getting a lot closer than they were. . . . *The Monarch Machine Tool Company, Sidney, Ohio.*

Monarch
TURNING MACHINES
ACCURACY • ECONOMY • LONG LIFE

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Look at the



"IT PAYS TO VAN NORMANIZE"

Production Advantages of the

VAN NORMAN

RAM TYPE MILLER

Regardless of the type of plant or the type of work, Van Norman Ram Type Millers can cut your milling costs and speed vital production. These versatile millers reduce idle machine time by as much as 50% because they enable the operator to perform conventional horizontal, vertical and angular milling on *one* machine. Look at what Van Norman Ram Type Millers can do for you —

Adjustable Cutterhead

By merely positioning the cutter head, the operator can perform horizontal, vertical or angular milling . . . the work of three single-purpose machines.

Increased Work Range

Movable ram plus the saddle crossfeed increase the work range and capacity of the miller . . . enable you to handle larger work pieces with ease.

Front and Rear Controls

Operating controls are located at front and rear for ease of operation. They eliminate back and forth operator motion . . . reduce operator fatigue.

Simplified Electric Control

Built-in electric controls simplify operation. Single lever selector controls spindle, feed, and coolant. Push button, on front of knee, starts and stops motors as pre-selected.

Load Meter

Built-in load meter indicates percent of load at which the cutter is operating. It enables the operator to operate miller at maximum efficiency . . . helps to prevent overloading of the miller motor.

Any way you look at it, the Van Norman No. 38 Ram Type Miller is your best buy for cutting costs, increasing production and accuracy.

Van Norman Ram Type Millers are available from 37" to 64" table lengths.

Write for complete information, today.

VAN NORMAN COMPANY

Springfield 7, Massachusetts

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52100

Steel Tubing and Bars

Largest Stocks in the Country..

of this versatile steel. 52100 is hard, tough and long-wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

Over 200 seamless tube sizes to choose from .898" O. D. to 8.250" O. D. Bar sizes from .171" round to 7.5" round. Also ring forgings in any analysis.

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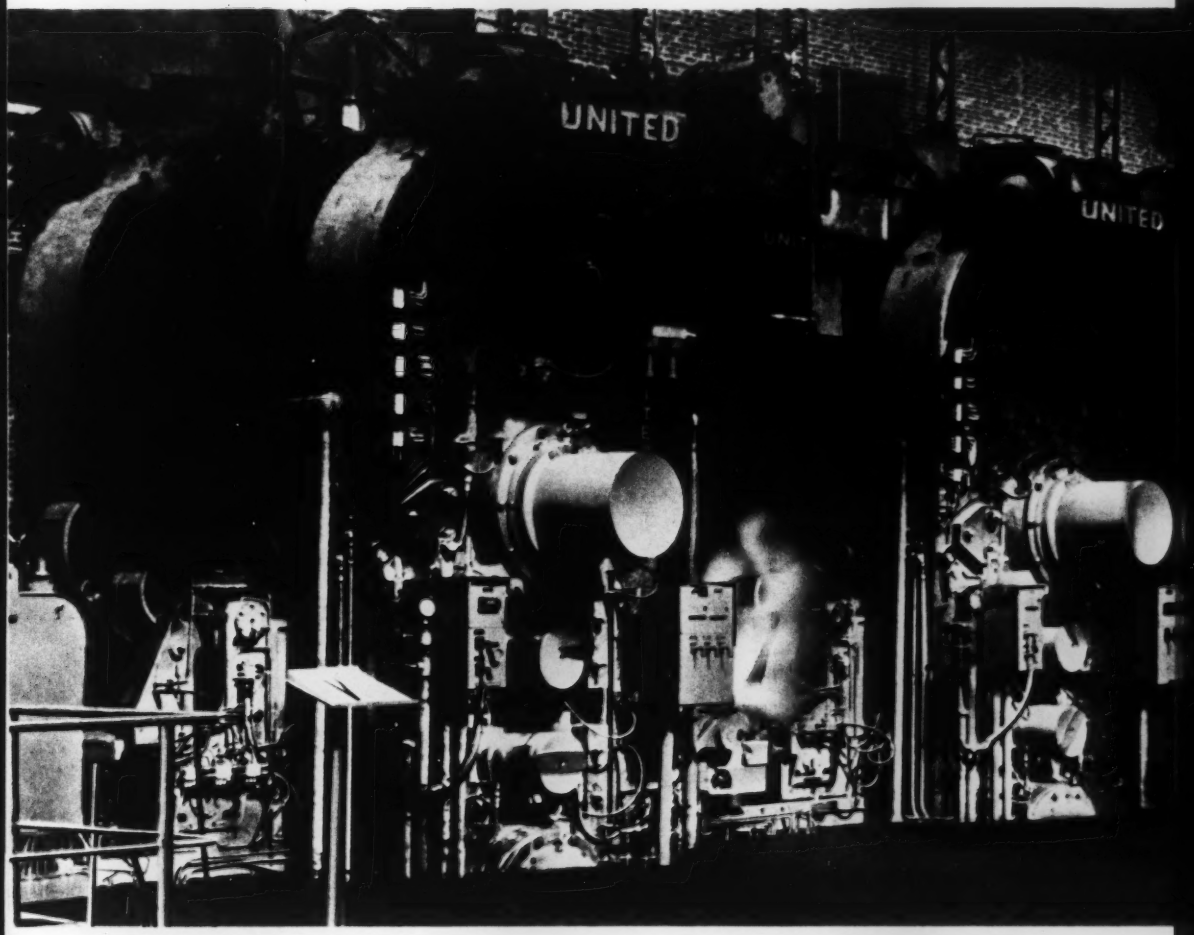

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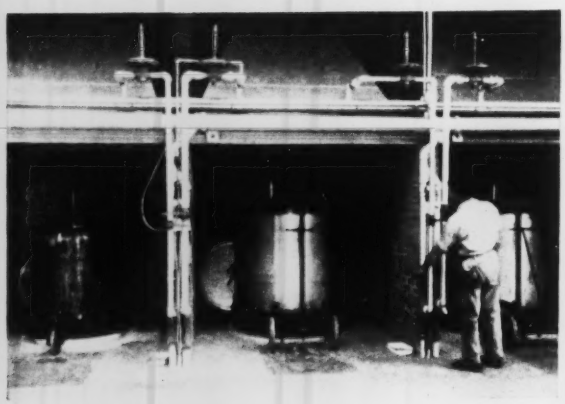
GAS
...THE MODERN FUEL FOR ALL INDUSTRY

conversion to GAS for Varnish processing

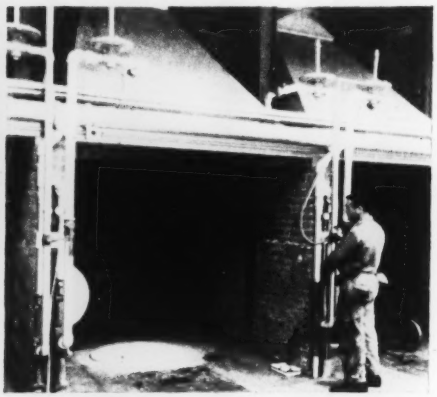
Increased Production 50%

at AMERICAN LITHOGRAPHIC VARNISH COMPANY, INC.
Kearny, New Jersey



THIS BATTERY OF SELAS GAS BURNERS provides precise temperature control, and has brought about a marked improvement in cleanliness and consequently in working conditions.

AMERICAN LITHOGRAPHIC VARNISH COMPANY, INC. installed this Modern Gas Equipment in 1949 for heat bodying and treating of various oils.



When the officials of American Lithographic Varnish Company converted to Gas:

1. **They increased production 50% at no increase in unit cost.**
2. **They obtained precise temperature control of process.**
3. **They greatly increased cleanliness of operation.**

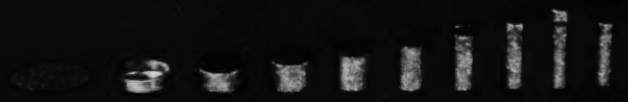
MORE AND MORE THE TREND IS TO GAS

GAS IS THE MODERN FUEL FOR INDUSTRY because Gas Equipment is simple to operate, needs no expensive accessory equipment, allows precise temperature control; Gas is clean, economical, and versatile. Check the facts on Modern Industrial Gas Equipment with your Gas Company Representative today.

AMERICAN GAS ASSOCIATION · 420 LEXINGTON AVE. · NEW YORK 17, N. Y.

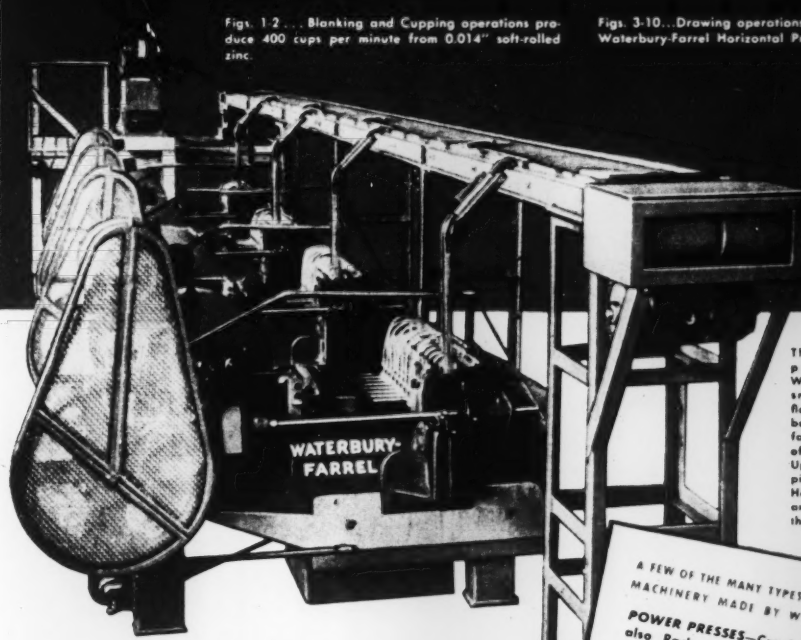
THIS WATERBURY-FARREL PRESS PRODUCTION TEAM

draws 340 shells per minute



Figs. 1-2 . . . Blanking and Cupping operations produce 400 cups per minute from 0.014" soft-rolled zinc.

Figs. 3-10. . . Drawing operations performed by each Waterbury-Farrel Horizontal Press.



This complete, automatic production unit by Waterbury-Farrel produces small zinc containers for flashlight and hearing aid batteries for a large manufacturer. The unit consists of a 40-ton Double-acting Upright Blanking and Cupping Press, four 7-station Horizontal Drawing Presses and a conveyor which feeds the presses.

Here's an example of the automatic mass production you can get with Waterbury-Farrel horizontal drawing presses.

These modern deep-drawing machines are available singly or in complete production line setups. The presses are available in a wide range of sizes for handling a large variety of work. The number of stations range from 5 to 12; maximum strokes from 3" to 26"; production speeds up to 100 per minute.

Features Include:

- High production — continuous deep drawing with no intermediate annealing.
- Patented shell transfer mechanism.
- Patented die-holder lubrication.
- Horizontally held shells cannot be deformed by trapped liquid.

For further details, write, wire or phone your nearest Waterbury-Farrel office.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL

POWER PRESSES—Crank · Cam and Toggle; also Rack and Pinion Presses · Transfer Presses · Multiple Plunger Presses · Hydraulic Presses, etc. **WIRE MILL EQUIPMENT**—Continuous Fine Wire Drawing Machines, including upright Cone and Tandem types Bull Blocks · String-up Machines · Spoolers, etc. · **COLD PROCESS BOLT AND NUT MACHINERY** — Headers (all types) · Re-headers · Trimmers · Thread Rolling Machines Slotters · Nut Tappers, etc. · **MILL MACHINERY** — Rolling Mills · Wire Flattening Mills, Chain Draw Benches · also Slitters · Straighteners · Pointers · Swagers · Cut-off Saws Coilers · Winders, etc.

FOUNDED WATERBURY FARREL 1851

In Equipment, Experience Counts . . .

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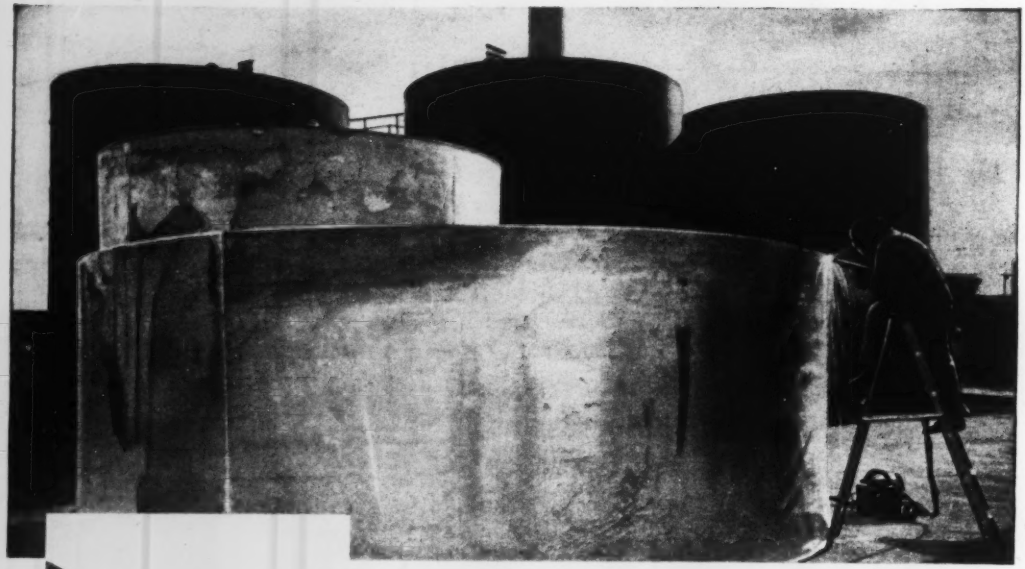

One welder. One helper. The Aircomatic Welding Process . . . and Universal Copper Works, Inc. Newark, N. J. fabricates a 50,000 gallon aluminum industrial acid tank for A. Gross & Company at a savings of 75% in filler rod and 50% in time over previous methods used.

AIRCOMATIC® WELDING *cuts costs of* "HUNGRY ACID" TANKS

Experts long knew aluminum was the answer for 'hungry acid' storage tanks . . . acetic, fatty acids, for example. Only a few years ago fabrication of these ideal tanks was a sizable problem.

Today that's all changed. Air Reduction's Aircomatic Welding Process has so simplified tank-building operations, that in-the-field construction has become routine practice.

Based on continuous feeding of bare filler wire in conjunction with inert shielding gases, the Aircomatic Process now presents the welder with these fabrication advantages:

1. Continuous, high-rate deposition o filler metal
2. Semi-automatic, all-position welding
3. Minimum plate-edge preparation
4. Heavy section welding with little or no preheat
5. No flux — elimination of slag removal
6. Visible arc — no blind welding

Find out how you can use Aircomatic welding. Write or phone your nearest Airco office. Ask for your copy of Catalog 17 "The Aircomatic Process". Also, inquire about Airco's film "The Tool for the Job" — the story of Aircomatic in full color.

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If you want to get the True Picture of what Rotary Slitting Can Be . . .

then get **SIMONDS**

"Red Streak" Forged Rotary Shears

For shearing cold sheet or strip . . . separately or in gang-slitting operations . . . these "Red Streak" Rotary Shear Knives do the job *as nothing else can do it.*

Forged from Simonds special Shear Steel . . . poured in Simonds' own steel mill . . . you can get "Red Streak" Shears in these 3 different alloys, each formulated for a specific application:

High-chrome steel, for shearing hot and cold rolled, tin plate and non-ferrous . . . *High-speed steel,* for hot and cold rolled . . . and *Special-alloy steel,* for hot and cold rolled and non-ferrous. Whatever your shearing job, Simonds has the knife that will stand up longer, cut cleaner, and at lower cost. Get in touch with your Industrial Supply Distributor *now.*

SIMONDS
SAW AND STEEL CO.
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Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que.
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Simonds Division: Simonds Steel Mill, Lockport, N. Y.; Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

Ask Yourself:

1 ***Do we have hand operations that could be mechanized?***

2 ***Is inferior mechanization hampering any operation?***

3 ***Can we use a greater degree of automatic control?***

4 ***Could we combine several operations into a continuous process?***

If your answer is yes, then you are not producing as fast and efficiently as you can

. . . and the immediate importance of your answers is this: from now on, your success as a manufacturer will depend more and more upon the degree of mechanization in your plant.

However, today, advances in mechanization are confined to breaking a production bottleneck, or matching a competitive process.

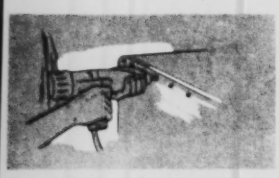
Let's look a bit further at replacing these sporadic improvements with a *planned* mechanization program.

The results are cumulative. Progressively, each operation is lifted to a higher level of mechanization on a sound economic schedule.

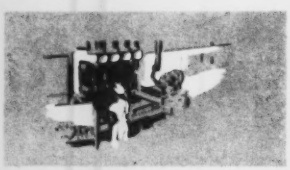
You are insured against tomorrow's competition. Manpower and scarce materials are conserved. Your profit position is strengthened.

To help you plan your mechanization, General Electric offers a new guide. We call it "Progressive Mechanization." It's a "More Power to America" program—another way to increase industrial productivity by spreading the knowledge of modern industrial techniques.

HERE ARE THE FOUR STAGES OF PROGRESSIVE MECHANIZATION

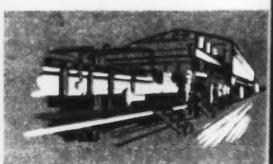


1 **Simple Mechanization**—simple machines driven by power—like this electric tool.



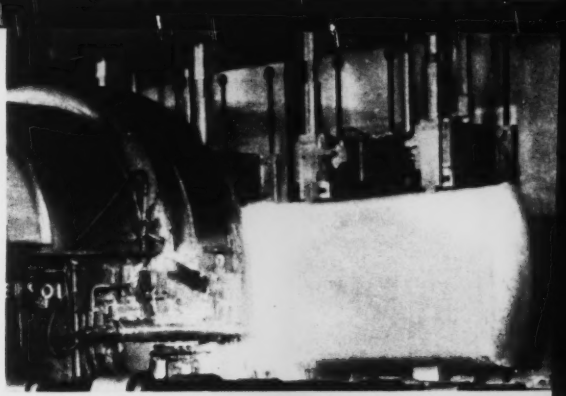
2 **Improved Mechanization**—more complex, like this drilling machine. Motors and controls aid manual operations.

3 **Automatic Control**—machines that have adjustable speed with "push-button control," like an automatic welder.

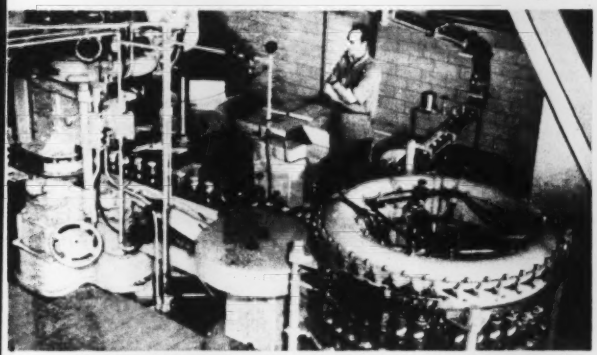


4 **Continuous Process**—machines co-ordinated for "start-to-finish" production.

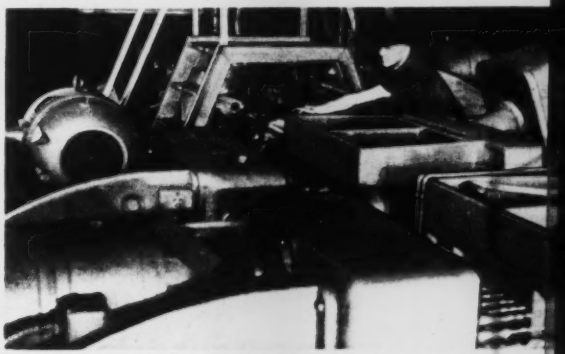
Simple mechanization—example: Lightweight electric impact tool tightens nuts in 1/10 the time a hand wrench takes.



Improved mechanization—example: Special milling machine replaces lighter type "scalps" aluminum billets 5' wide 10' long.



Automatic control—example: Adjustable-speed beer-can filling machine will change rate of production to meet any condition.



Continuous process—example: 216 operations are made on cylinder block in 36 seconds by automatic-transfer-type machine.

How you can improve production in your plant with the G-E Progressive Mechanization Program

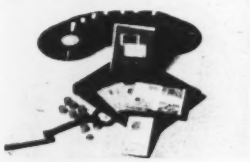
START OFF with a "launching ceremony"—have all of your engineers and key people see the full-color movie "Motors in Industry." You'll drive home to them the importance of improving mechanization in your plant.

This informative film has more than 40 interesting mechanization case histories. Shots from four of them are pictured above. They are just a few of the examples that you can use to stimulate interest in mechanizing *progressively*.

CHANNEL THIS INTEREST—do some practical, organized probing into your present production methods. General Electric's Progressive Mechanization manual may help show you the way. Hand out the special mechanization survey forms. You can use them to enlist the participation of as many persons as you wish, including the men "at the bench."

WANT TO LEARN MORE? You get a free copy of the Progressive Mechanization manual, and indicate interest in seeing "Motors in Industry," just by sending in the coupon below. Or contact your nearest G-E Apparatus Sales Office.

GENERAL ELECTRIC



Back up your Mechanization Program with the G-E Motor Selection Course

Here's a complete course, covering the fundamentals of motors now available. It explains how to select and supply motors, what sort of control to use. Your local G-E representative can make arrangements for you to use this course.

MORE POWER TO AMERICA programs are guides to increase the efficiency of American Industry. They stimulate wider, more efficient use of electricity in production.

MORE POWER TO AMERICA

Section S 732-14
General Electric Co., Schenectady 5, N. Y.

I'd like to learn more about the new G-E Progressive Mechanization program.
I'm interested in:

- ☐ A free copy of the Progressive Mechanization manual.
- ☐ Seeing the motion picture on Progressive Mechanization.
- ☐ Using the "Motor Selection & Application Course."

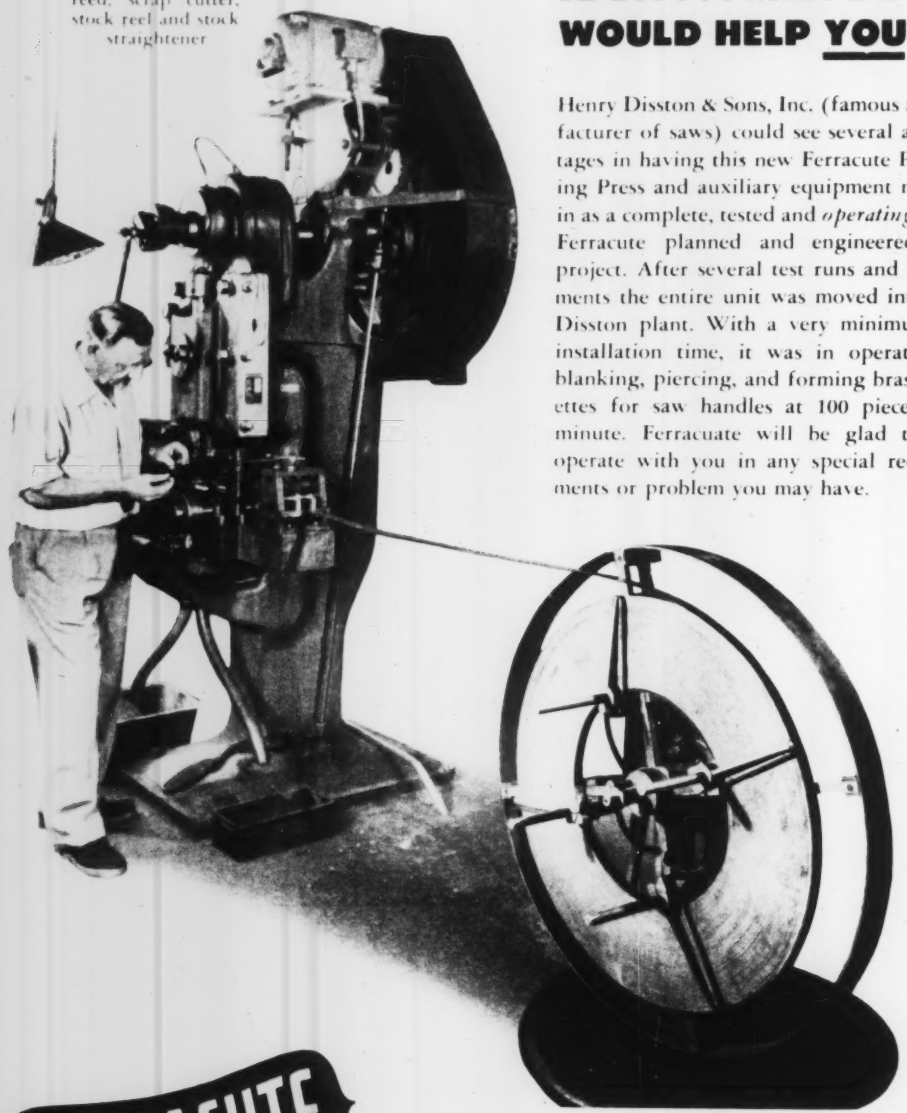
Name _____ **Title** _____

Company _____

Address _____

FERRACUTE P-3 40-TON PUNCHING PRESS

as set up in the plant of Henry Disston & Sons, Inc. with double roll feed, scrap cutter, stock reel and stock straightener



DISSTON LIKED THE IDEA . . . MAYBE IT WOULD HELP YOU TOO

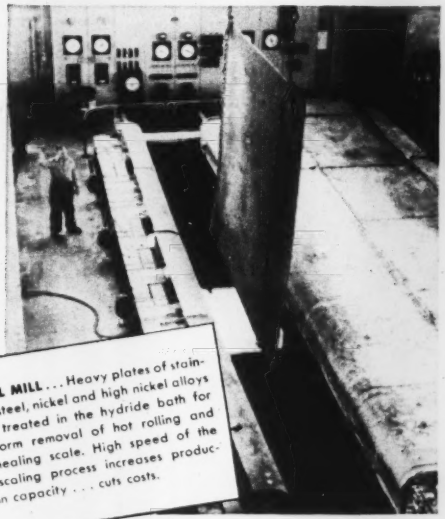
Henry Disston & Sons, Inc. (famous manufacturer of saws) could see several advantages in having this new Ferracute Punching Press and auxiliary equipment moved in as a complete, tested and *operating* unit. Ferracute planned and engineered the project. After several test runs and adjusments the entire unit was moved into the Disston plant. With a very minimum of installation time, it was in operation—blanking, piercing, and forming brass rosettes for saw handles at 100 pieces per minute. Ferracuate will be glad to cooperate with you in any special requirements or problem you may have.

FERRACUTE
SINCE 1868

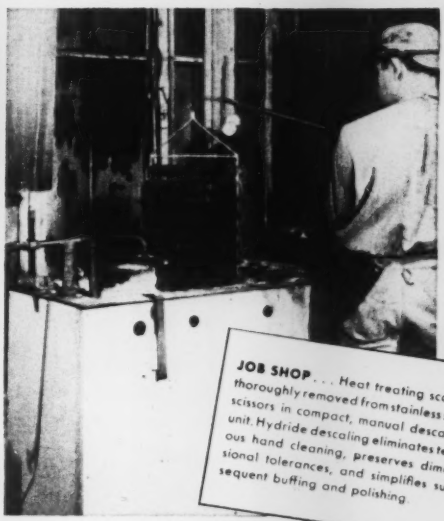
MACHINE COMPANY

Power Presses and Special Machinery, BRIDGETON, N. J., U. S. A.

NO SECTION TOO BIG . . . NO PART TOO SMALL



STEEL MILL . . . Heavy plates of stainless steel, nickel and high nickel alloys are treated in the hydride bath for uniform removal of hot rolling and annealing scale. High speed of the descaling process increases production capacity . . . cuts costs.



JOB SHOP . . . Heat treating scale is thoroughly removed from stainless steel scissors in compact, manual descaling unit. Hydride descaling eliminates tedious hand cleaning, preserves dimensional tolerances, and simplifies subsequent buffing and polishing.

FOR THE
DU PONT SODIUM HYDRIDE DESCALING PROCESS

FROM OUNCES TO TONS! That's the capacity range of current sodium hydride installations in mills, factories and job shops of all sizes. And with each unit, the same results—speedy, uniform descaling of many different metals at a saving in time and material. Hydride descaling leaves surfaces clean and bright . . . does not attack base metal. Yet, scale is thoroughly removed from even the most intricate part by the penetrating bath action.

FOR MORE INFORMATION about the Du Pont Sodium Hydride Descaling Process, just get in touch with our nearest district or sales office or send the coupon below to: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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OUTSTANDING ADVANTAGES OF THE SODIUM HYDRIDE PROCESS

- **HIGH-SPEED OPERATION**—Descales in shortest practicable time cycle . . . can be adapted to manual, conveyorized or continuous operation.
- **NO LOSS OF BASE METAL**—Bath action is reducing. Reaction stops when oxygen is removed from scale, eliminates pickling losses, etching and pitting.
- **ECONOMICAL TO OPERATE**—Permits savings in acid and metal . . . handles large volume of work in small space . . . is non-electrolytic.
- **HANDLES DIFFERENT METALS**—Alloy steel, stainless steel, nickel, copper, titanium and cobalt bearing alloys can be efficiently descaled—even in the same bath.
- **UNIFORM DESCALING**—On all surfaces without need for special racking procedures.
- **USES LOW-COST EQUIPMENT**—(Carbon Steel Tanks). NO HYDROGEN EMBRITTLEMENT.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Wilmington 98, Delaware

Please send me more information on the Du Pont Hydride Descaling Process: advantages, applications, equipment used. I am interested in cleaning_____products.

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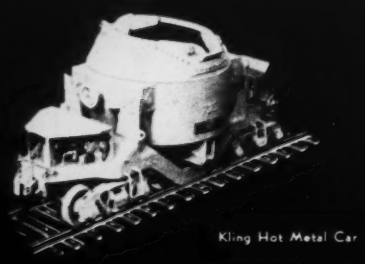
DU PONT
Sodium hydride process for positive descaling

DU PONT 150th Anniversary
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

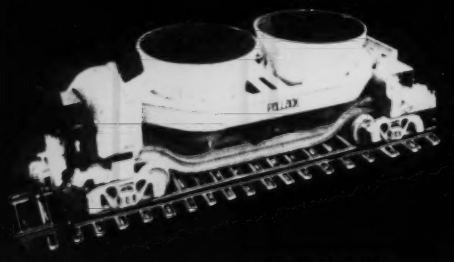
BLAST FURNACE CARS FOR THE IRON AND STEEL INDUSTRY . . .

POLLOCK

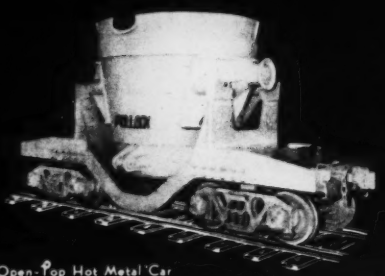
BUILDS ALL TYPES



Kling Hot Metal Car



Double Pot Cinder Car



Open-Top Hot Metal Car

POLLOCK hot metal cars are equipped with demountable ladles, standard or "tailor-made" to meet your individual needs—in any capacity up to 100 tons—and these can be made even larger, depending on railroad clearances. The car bodies are of welded steel construction, either all-welded in one piece, or with end and side frames bolted together to save space in shipping. Both Kling and Open-Top types can be supplied for long pouring or short pouring.

POLLOCK cinder cars, made for air, steam, or electric operation, are sturdily built of all-rolled welded steel construction, with pots of capacities up to 400 cubic feet each. Operating equipment can be arranged to dump from either side, and trucks have A. A. R. standard wheels, axles, bearing brasses and springs. Special end-thrust bearings or roller bearings of your choice can be provided.

Let Pollock's expert engineers make a study of your hot metal and cinder handling requirements, and recommend the blast furnace car equipment best suited to your plant.

POLLOCK

THE WILLIAM B. POLLOCK COMPANY

YOUNGSTOWN · OHIO

STEEL PLATE CONSTRUCTION · ERECTION · FABRICATION · WELDING

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOULD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

Oil-display service cabinets get lasting paint adherence

Industry surveys indicate that between 70% and 90% of all automotive lubricating oils are sold in cans . . . much of it from oil-display service stands fabricated of Republic Electro Paintlok by Modern Metal Products Co., Greensboro, N. C.

● To keep oil-display service cabinets looking trim, bright and attractive on service station islands, this manufacturer has adopted Republic Electro Paintlok for all enameled cabinet surfaces.

Electro Paintlok is the zinc-coated sheet steel that's chemically-treated to *take* paints, lacquers and synthetic enamels *smoothly* . . . and *hold* them all equally well.

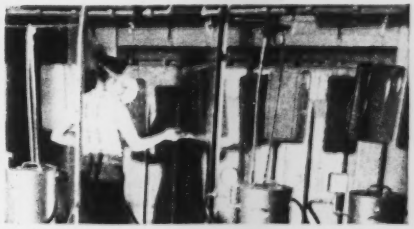
Even if the painted surface should be scratched or broken in service, the tight zinc coating prevents the spread of unsightly underfilm corrosion. Result: users of steel products enjoy a painted finish that *lasts*.

Electro Paintlok offers manufacturing economies, too. It comes to you in prime condition for painting, and usually requires only one simple cleaning to remove dirt acquired during storage and fabrication. Degreasing is necessary, however, when drawing compound is used, or when grease is present from other sources.

For all its full product-improving story, write for colorful free booklet 525. Address:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

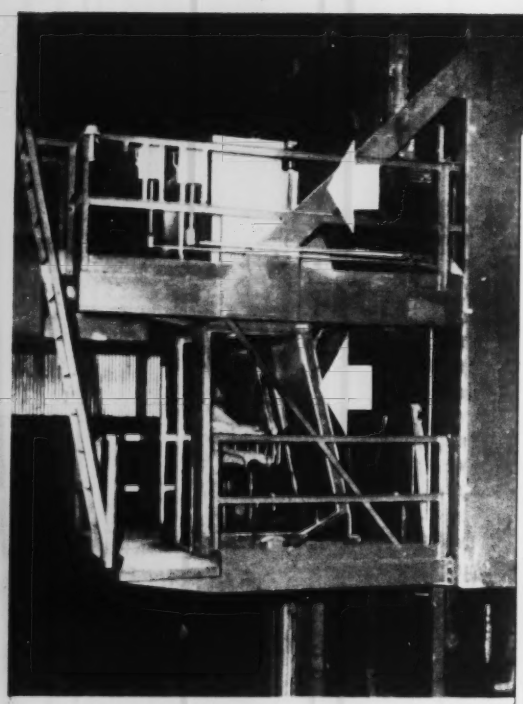
Republic Electro Paintlok offers a tight zinc coating that will not crack, peel or flake during normal fabrication.



Oil-display service cabinet parts are sprayed with alkyd-resin enamel primer heated to 150 F.

Republic
ELECTRO ZINC PLATED SHEETS
Electro Paintlok • Electro Zincbond

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire



NOW
60° F. cooler inside
for this stripper crane operator at Ford Motor Company

MAJOR WORKING HAZARD ELIMINATED FOR RIVER ROUGE PLANT CRANE OPERATORS

Extreme temperatures up to 140° F. around stripper cranes like this one at Ford Motor Co. limit an operator's working endurance. Dravo Crane Cab Coolers are designed to lower the cab temperature to 80° F. providing operators with greatly improved working conditions. Not only is the crane operator's health safeguarded but his alertness and efficiency are much increased.

CRANE CAB COOLERS HAVE LONG SERVICE LIFE, PROVIDE YEAR-'ROUND AIR CONDITIONING

Dravo Crane Cab Coolers are ruggedly constructed, factory assembled and pre-tested to provide years of more-than-satisfactory service. All equipment in the unit is readily accessible with ample space for quick and efficient maintenance.

In the various air conditioning functions the crane cab cooler not only filters the air, removes dust, dirt and fumes, but heats the cab in winter, cools it in summer and provides constant ventilation the year around.

AVAILABLE IN SINGLE UNIT OR IN SPLIT-TYPE UNIT: IMMEDIATE DELIVERY

Dravo Crane Cab Coolers are built in two models—the self-contained unit, mounted on any available space on the crane, and the new split-type unit where the condenser section is mounted on the crane with the conditioning section in the cab.

The Dravo Crane Cab Cooler can be easily and quickly installed on any type of crane with a minimum of down-time required. Units are available now! Write for more information—or phone the nearest Dravo office and have our representative call on you. Dravo Corporation, 606 Dravo Building, Fifth and Liberty Avenues, Pittsburgh 22, Pennsylvania.

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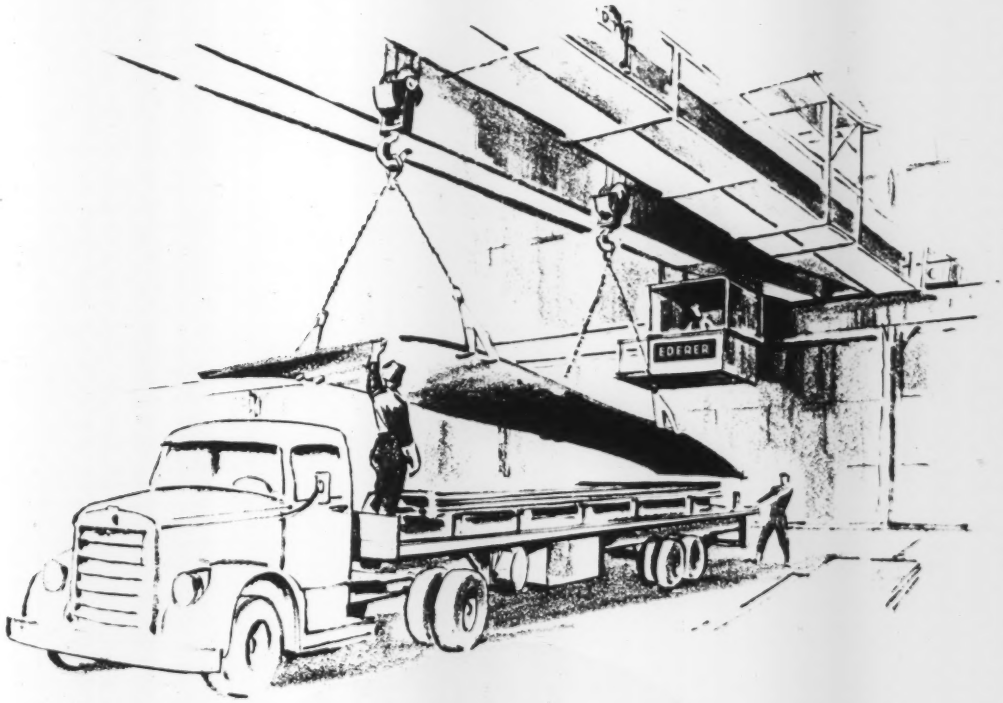

For steel warehouse service

Materials handling in a steel warehouse calls for a versatile, fast-operating crane. For one of A. M. Castle's warehouses, EDERER "job-engineered" this two-trolley, 10-ton, 70-foot span crane to handle steel plate rapidly and economically. This crane is typical of hundreds of cranes engineered and built by EDERER to meet exacting job requirements.

Whatever your industry, you have your particular handling requirements. EDERER—one of the largest crane manufacturers in the WEST—can "job-engineer" a crane to meet them. DELIVERY? WHEN DO YOU WANT IT? Write for Crane Bulletin CR-500.

210C52

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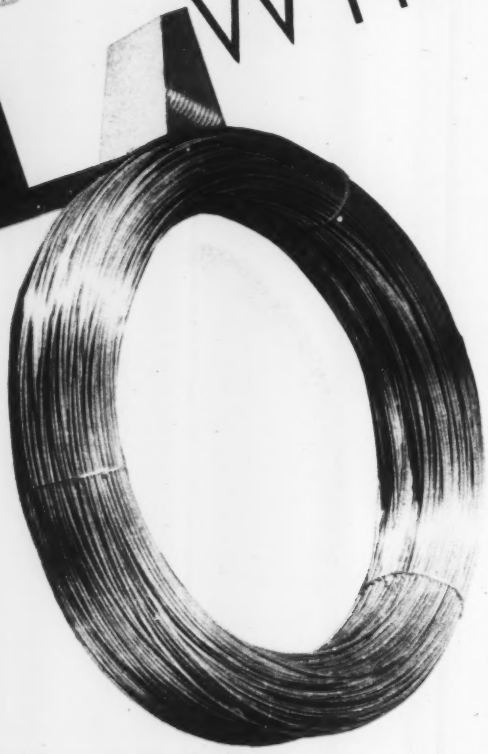
Export Division: 301 Clay St., San Francisco 11, Calif.

50 YEARS "JOB ENGINEERING" CRANES FOR INDUSTRY

EDERER

CRANES

eagle MUSIC WIRE



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WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

"Tycol Anepro carries heaviest loads... lowers bearing failure... slices lubrication costs"

Indeed it does! Tycol Anepro Greases measure up to severest shock-load conditions encountered in the rolling of steel. They protect bearings from moisture, heat, and abrasive impurities. Anepro's exceptionally high film strength and non-corrosive properties result in far longer bearing life . . . faster rates of production . . . minimum down-time for heavy-duty equipment.

Call or write today for complete information from your nearest Tide Water Associated office.

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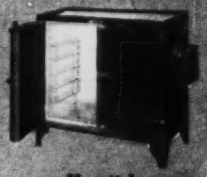
Outstanding ACCURACY

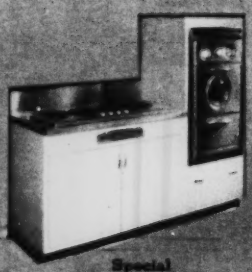
TO PRODUCE

Modern Steel Kitchen



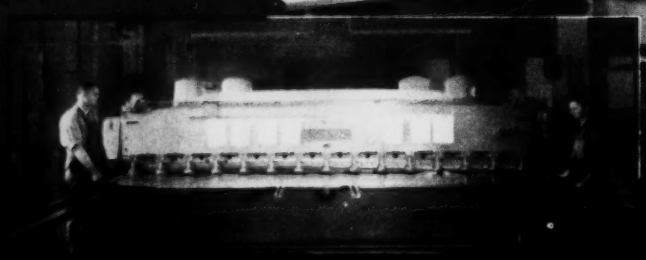
Hospital Sterilizer

Hospital Utility Cabinet



Special Stove

Three Cincinnati All-Steel Shears at Jamestown Metal Products Inc.



1814 Cincinnati All-Steel Shear with hydraulic holddowns, squaring arm and front controlled power back gauge.

is necessary...

THESE TOP QUALITY PRODUCTS

ACCURATE SHEARING

Jamestown Metal Products Inc. produces quality stainless steel equipment for hospital and home. Exact manufacturing standards are maintained.

Cincinnati Shears cut blanks accurately and to size for this equipment. Gauging must be rapid as well as accurate to handle the many different sizes required and keep production costs low.

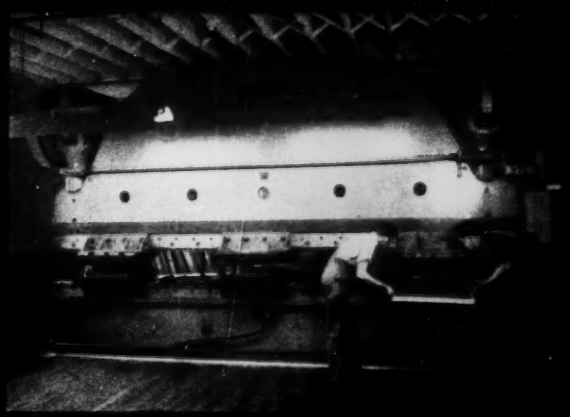
ACCURATE FORMING

Cincinnati Press Brakes form these blanks into accurate parts that fit correctly and insure outstanding quality in the finished products as well as maintaining low assembly costs.

You, too, can expect true blanks and accurately formed parts from this profitable team of Cincinnati Shears and Cincinnati Press Brakes.

Write for Catalogs S-6 and B-3, illustrating and describing these machines.

A row of Cincinnati All-Steel Press Brakes used in the production of these quality products



A 130 x 14' Cincinnati All-Steel Press Brake 14' 6" between housings tooled for multiple operations

THE CINCINNATI SHAPER CO.

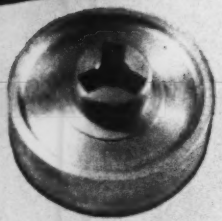
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

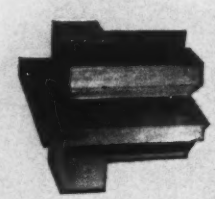
Outstanding ACCURACY is necessary...

TO PRODUCE THESE *top quality products*

Slots, angles and compound angles are shaped to 0.001" limits on these solid 3140 forged steel tool holders.



Special index heads have slots accurate in shape, size, spacing and angularity to 0.001" on all dimensions.



Vee block fixtures of solid 6145 steel are completely shaped to very close limits.

Cincinnati Shapers do these jobs

The Jordan Specialty Company . . . Shaping Specialists . . . use Cincinnati Shapers exclusively. Outstanding accuracy and versatility in production are obtained in connection with low machine investment and low tooling costs. Due to the great variety of work produced, changes from part to part must be done with minimum loss of time. Here, Cincinnati Shapers give an exceedingly profitable and outstandingly accurate performance.

Write for Shaper Catalog No. N-5 covering the complete Cincinnati line.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

October 27, 1952

Another Aluminum Producer?

Wheland Co., Chattanooga, Tenn., producer of saw mill machinery, rotary drilling equipment and operator of a gray iron foundry, wants a share of the third round aluminum expansion. It's negotiating with Samuel W. Anderson, DPA aluminum czar, who will decide which, if any, of the interested companies can get some government help through tax amortization, market guarantees or defense loans. Wheland's proposal calls for construction of a $70 million plant in the Chattanooga area to produce 150 million pounds of aluminum annually.

On Their Mark

The steel companies that compete with U.S. Steel in the East, notably Bethlehem, are getting on their marks to be set to go when the race for the area's markets commences. Starting gun will sound when the Fairless Works begins volume production. Bethlehem has already done a lot of preliminary training—cementing customer relations, even lining up new buyers despite the current steel shortage. Competition will be keenest on flat-rolled products.

Groomed as Steel Spokesman

Keep an eye on Charles Lukens Huston Jr. The youngish president of Lukens Steel is emerging as a new spokesman for the iron and steel industry. In Cleveland last week, he warned that the politically-enforced steel strike settlement of last summer was not a complete settlement at all, that many bothersome issues remain unresolved and will cause trouble in the months to come.

NPA Sticks to Its Guns

Most producers and users of steel think the need for controls will be over by next spring, but most Washington planners stick to their beliefs that next summer will be the earliest the curbs can be lifted. NPA sees no chance of easier supplies in round bars 2 inches and over before next June 30. It expects plates to be in tight supply until next spring, but strip should ease by next February or March. The agency sees no immediate sign of a catchup in heavier sizes of structural steel. Nor does it think that new capacity of about 5 million tons annually will have much effect on the market before the second three months of 1953.

Distribution Snafu

Appliance makers are now joining auto builders in the parade to Washington to argue for more first quarter tickets. Part of their alarm stems from ambiguous newspaper stories based on some misleading NPA releases sent out lately. Steel production is increasing (p. 121) and nonferrous output is holding up well (p. 133). The trouble lies in a snafu on distribution and CMP allotments, not in declining produc-

Production-Engineering News p. 71 The Market Outlook p. 121

tion. NPA men are trying to find a solution, but probably won't come up with anything until the middle of November.

More Auto Parts for 1953

Automotive replacement parts manufacturers expect a big 1953. Their estimated requirements for civilian parts is 3,123,706 tons of steel, copper and aluminum for next year, up 137.1 per cent over 1950 consumption. They anticipate their greatest production increases in gears, axles, drive shafts and leaf springs. They're joining other segments of the auto industry in pleas for more CMP tickets.

Coal Stocks Good, but . . .

Most industrial coal users have two-to-three months' supplies (p. 47). An exception are some steel companies close to coal fields. They normally operate with light stocks at their plants, depending on quick deliveries from the bituminous producers. Many of the Youngstown steel plants are in that position, and estimate that their operations will be affected if the coal strike lasts two more weeks.

Home Cooling Gets Hot

Watch for a banner 1953 in production and sales of residential cooling and heating units. The air conditioning industry is selling 50 per cent more home units this year than last. Carrier Corp. President Cloud Wampler predicts his company will have a 100 per cent increase in that phase of its business in 1953. He says, "Before very long speculative builders will place their bets only on fully air conditioned dwellings." Carrier is backing up that estimate with a new $7 million plant to be devoted to manufacture of home air conditioning and other unitary equipment.

Straws in the Wind

Extraction of manganese from "wad" ores, particularly in Virginia and Arkansas, may be made economically feasible if a government project is successful . . . House trailer builders used 14,200 tons of aluminum in 1950, expect current output to hike the figure 19 per cent this year . . . Dr. George K. Schweitzer, nuclear chemist training Oak Ridge scientists forecasts electricity 175 times cheaper than today with atom power; General Electric Co. says that only a reduction in price of 20-25 per cent would be possible with atomic-generated power . . . Canada will grant 100 per cent duty rebates on construction machinery, equipment and materials imported for the Quebec-Labrador iron ore deposits.

What Industry Is Doing

It's Eisenhower four to one in STEEL's poll of Metal Show visitors; in 1948 they favored Dewey three to one (p. 43) . . . A schism in Washington develops as some lame-duck officials in the Truman administration favor acting now on economic matters, but others wish to mark time until the new President takes over (p. 45) . . . Makers of weldments are pushing hard to equal or better last year's postwar sales record (p. 46) . . . A spherical laboratory for atomic research—called the atom's apple—may bring new nuclear developments (p. 48) . . . Do you have cost control problems? See pg. 53 for a good solution.

Only MARVEL *builds all four**

While it is true there are several builders of hack sawing machines and many builders of band sawing machines, only MARVEL builds *BOTH* hack saws and band saws. The fact is that MARVEL manufactures 35 models of 10 basic types of metal sawing machines which include the world's fastest automatic production saw, the world's largest giant hydraulic hack saws, the world's most versatile band saw and the most widely used small shop saws.

With intimate and broad field experience in all types of metal cutting-off equipment and 35 different saws available, it is obvious that MARVEL Field Engineers occupy a unique and exclusive position in the industry. They are eminently qualified to make expert and *unbiased* recommendations covering the type, size and model of metal sawing equipment best suited to individual requirements — the most efficient, most accurate, fastest, broadest in scope and the most economical.

MARVEL is also the only manufacturer of both metal sawing *machines* and metal sawing *blades*. Because the efficiencies of both the machine and the blades are interdependent, each upon the capability of the other, expert knowledge covering both saws and saw blades is essential to the proper appraisal of any specific sawing situation. Correct balance of cutting speed and blade life, feed pressure and blade tension are all potent factors in over-all performance. Here again it is the MARVEL Field Engineer who is qualified to provide the comprehensive answer to your question. His job is to help you saw metal most efficiently — his services are available upon request — gratis.

***HACK SAWING MACHINES**

***BAND SAWING MACHINES**

***BAND SAW BLADES**

***HACK SAW BLADES**

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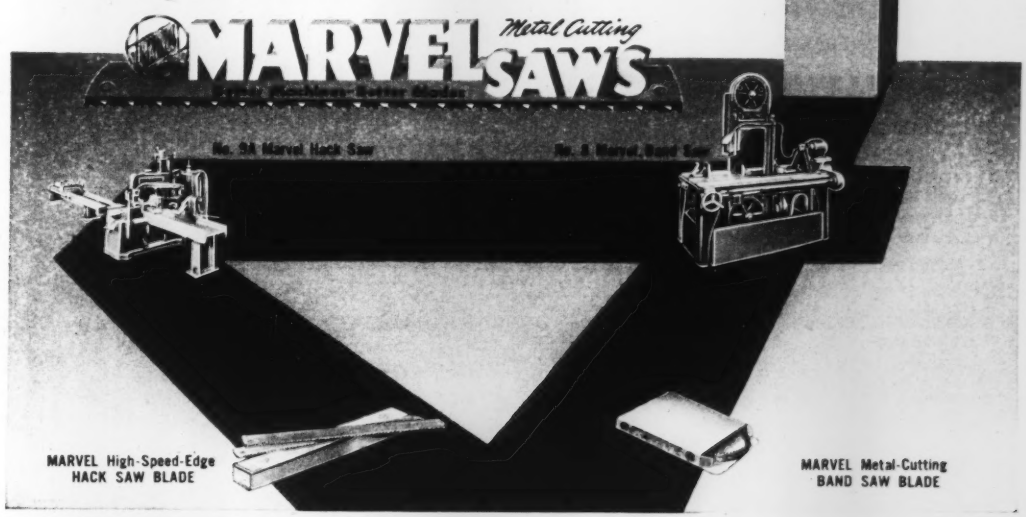

STEEL STRIP*

for relief of "variation" headaches

We do not say that Cold Rolled Steel Strip is a production cure-all. Not even such good Strip as D S C makes!

But if excessive gauge and temper variation is giving your press or roll-forming departments production headaches, Steel Strip may be just the antidote you need.

Steel Strip does possess *uniformity* and *accuracy* of gauge and temper.

In Strip making, the leeway for thickness averages only about half of what's allowable for cold rolled sheets, for example.

Temper, too, is more closely controlled. Strip rolling and heat treatment methods give you just the temper you need—*graduated* from soft to full hard—to fit your job.

And if your headaches come from variances in surface quality, Strip will bring you welcome relief. Take your choice, *either* bright *or* "satin"—and consistently so.

**STRIP must not be confused with "S H - R I P" which is sheet steel cut into strip widths, in coils or otherwise. Any reliance "Dan" will gladly tell you more about D S C STRIP.*

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

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PRODUCERS OF

Coke and Coal Chemicals · Pig Iron · Ingots
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COLD ROLLED STEEL STRIP and FLAT WIRE

Coils . . . Cut Lengths . . . All Tempers

SHEETS

COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED

Standard and Production Sizes or Cut to Actual Working Dimensions

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Our Golden Opportunity

A week from tomorrow Americans will elect a president, vice president, certain members of Congress and other public officials. By virtue of a concentrated drive in which scores of public-spirited organizations have participated, more persons are registered to vote in 1952 than in any previous presidential election.

This is gratifying. For decades the percentage of eligible voters who take the trouble to go to the polls has been declining. Fifty years ago, three-quarters of the persons eligible to vote did so. In 1948, only 52 per cent entitled to vote cast ballots. This is a disgraceful showing. In recent elections in Great Britain, Australia, Sweden and West Germany, more than 75 per cent of the eligibles have voted.

The improvement in registration presents us with a wonderful opportunity. If we can convert the registrants into actual voters on November 4, we will have established a new high in voting in a presidential election. We will have reversed the disgraceful trend. We will have set a good example for future generations.

These incentives should spur us to extraordinary effort to get out a maximum vote on election day. We should plan now to clear the decks so that we can assist as many as possible of our friends, associates, employees, neighbors and others to get to the polls on November 4.

Be particularly attentive to the person who says his vote is unimportant. Every vote is precious. Great causes have been won or lost by the margin of a single vote. Above all do not permit anyone to fail to vote because it seems to be inconvenient.

In 1776, when the Continental Congress was in session, Caesar Rodney of Delaware was notified that his vote was needed in an approaching balloting on whether or not the colonies would declare their independence of the British crown. He responded by riding horseback from Dover to Philadelphia to cast his important vote.

You are not required to mount horse and ride 75 tedious miles to vote. You can vote near your home. You can do it in a few minutes. Exercise your priceless freedom to vote!

E. C. Shaner

EDITOR-IN-CHIEF

METAL SHOW IMPRESSIVE: Many of the thousands who attended the National Metal Congress and Exposition in Philadelphia last week pronounced it the most impressive in the 34-year history of the event. Persons who paced the red-carpeted aisles of this really large show were struck by the emphasis placed by exhibitors upon new applications of metals and

alloys, automaticity in treating, plating and other processing operations, refinements in the examination and testing of materials, and modern instrumentation in many forms.

Technical programs of the American Society for Metals, American Welding Society, Institute of Metals, Society for Nondestructive Testing and Metals Section of Special Libraries Association were marked by a more than usual concentration of discussion upon comparatively new techniques which are employed in the jetomic age in which we are advancing rapidly. The frequency with which terms such as ultrasonic pulse technique, ionization and radioactive tracers were heard in discussions gives a hint as to the direction we are moving in metallurgy and allied fields. The 1952 Metal Show and Congress was prophetic of future developments.

OPTIMISTIC ABOUT 1953: Visitors to this publication's booth at the Metal Show were given an opportunity to vote on several questions. Up to closing time Wednesday 1713 had cast ballots. Of these 1159 voted for Eisenhower and 298 for Stevenson. This is about what one would expect at a metal show. Somewhat puzzling is that 256 of the 1713 voters did not indicate a preference for president. That 15 per cent remained undecided at this late date may be significant.

On other questions 57 per cent of the voters said they are getting enough steel, 53 per cent enough copper and 63 per cent enough aluminum. More than 60 per cent favored discontinuance of government controls after January. Metal Show visitors are optimists; 84 per cent of those who voted expect production in 1953 to exceed that of 1952.

WAGES AND POLITICS: Acting on the belief that the Wage Stabilization Board would approve anything the owners and union could agree upon, John L. Lewis negotiated a contract with coal operators which provided for a wage increase of $1.90 per day. After due deliberation WSB decided that an increase of only $1.50 per day is allowable under the government's policy. The mine owners say they cannot violate a government order and will pay only the authorized increase of $1.50. Mr. Lewis and his miners, contending that this breaks the contract, threatened to stay away from the pits until the $1.90 increase is granted.

Having from the first used WSB for political advantage, the Truman administration now finds itself in an embarrassing position, which is further complicated by the recent formal endorsement of presidential-nominee Adlai Stevenson by Mr. Lewis. If President Truman should yield to Mr. Lewis by overruling WSB, it is likely its members will resign. Happy will be the day when collective bargaining is completely divorced from politics.

TRANSPORTATION FEAT: Financial pages of some daily newspapers last week carried figures which show a marked increase in efficiency in the handling of freight by American Railroads. In 1931, the class one railroads performed 309,225,000,000 ton miles of freight service with 28,296 locomotives and 2,201,510 freight cars. In 1951, they provided 646,607,000,000 ton miles of service with 18,683 locomotives and 1,745,725 cars. This means that last year the roads furnished more than double the transportation they had supplied 20 years previously and that they did it with 34 per cent fewer locomotives and 21 per cent fewer freight cars.

This feat reflects improved operating methods such as heavier loading per car and per train and higher train speeds. It also reflects improvements in materials and in the design of locomotives, cars and equipment. There still is room for improvement and the figures for 1971 may show gains even greater than those of the past two decades.

THIRD IN SHIPBUILDING: It is rather odd that the United States, which leads the world in many lines of manufacture and construction, lags behind in shipbuilding except in periods of great emergency. From a high plane of hectic activity in the building of ships for World War II, the nation's yards have slipped gradually into third place among the nations of the world. Strangely enough, the country that has edged the United States from second into third place is Japan. Lloyd's Shipping Register, reporting for the third quarter of 1952, places Great Britain first with 2,062,482 tons of shipping under construction, Japan second with 602,500 tons and the United States third with 600,173 tons.

A man who can help you get STEEL!

In these days of great demand, the help of an experienced steel man is especially valuable. Did you realize that the services of such a man are available to you without cost or obligation? This man is your Ryerson steel service representative—a specialist in getting available steel to you quickly.

He cannot make steel, of course, but he does have up-to-the-minute information on our stocks at his finger tips. He does have years of steel experience that often enables him to recommend practical alternates when the steel you need is not on hand. And he does know every phase of Ryerson service from testing for quality to dependable delivery, including heat treating, sawing, shearing, flame cutting or otherwise preparing steel to your particular requirements.

He represents, and has the wholehearted support of, the largest steel-service organization in the world. Working closely with him are Ryerson engineers, metallurgists—authorities on carbon, alloy and stainless steels—ready for quick cooperation on unusual problems.

While we have thousands of tons of steel on hand for immediate shipment, it is spread among 15 plants from Boston to Seattle. And the recent steel strike, plus continued heavy demand, has unbalanced our stocks badly as to sizes and types. We believe this is the situation throughout the industry.

But your Ryerson service man is always ready to assist you . . . ready to help you scour the country from coast to coast to get the steel you need. So, talk over your steel problems with him the next time he calls.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate.

SHEETS—Hot and cold rolled, many types and coatings.

TUBING—Seamless and welded, mechanical and boiler tubes.

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

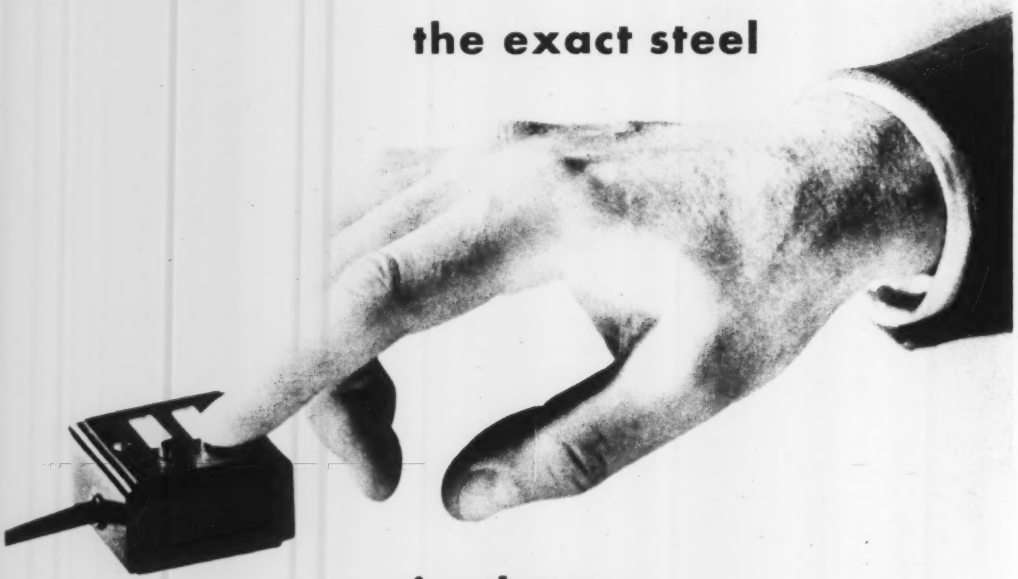
MACHINERY & TOOLS—For metal fabrication.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

selecting

the exact steel



is almost

this easy!

The age of push-button steelmaking has not yet arrived. But many a steel buyer has learned that a buzz to his secretary is the first step in making contact with a team of steel experts who can put their special knowledge and skills to work making the *right* steel to do the job. We have this team at Inland.

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1948—They said DEWEY—three to one . . .

1952—They're saying IKE—four to one . . .

Metal Show Visitors Speak Up

IT'S EISENHOWER for President. So say metalworking executives attending the National Metal Congress & Exposition in Philadelphia Oct. 20-24.

Metal Show visitors expressed their preference for the Republican candidate by a 4 to 1 margin in automatic voting machines in STEEL's booth. Of 1457 voting for presidential candidates in the first three days of the convention, 1159 voted for the general, and 298 voted for Adlai Stevenson, the Democratic candidate.

Better than 1948—A goodly majority for the Republican candidate naturally is expected from a group such as that attending the Metal Show. The Republican majority, however, is substantially greater than that recorded under a similar poll taken by STEEL at the 1948 Metal Show. At that time, visitors voted for Thomas E. Dewey over President Truman by a 3 to 1 margin.

Would End Controls—Sixty per cent of the Metal Show visitors said that the government should end controls over materials and prices by January. With 1514 voting on this question, 906 wanted the government to end controls.

Optimistic—Production will continue to expand in 1953, says an overwhelming majority of the metalworking executives. Eighty-four per cent expected a greater volume of output in 1953 than in 1952.

Costs Up—Production costs will continue to rise next year, in the opinion of 75 per cent of the Metal Show visitors who voted.

Seen, Heard at the Show

LESS fatigue was experienced by the nearly 50,000 Metal Show visitors this year than at previous expositions. Reason: Nylon pile on rubber carpeting was laid through all the aisles.

An installation enabling use of natural gas with the Cincinnati Milling Machine Co.'s surface hard-

The Editors Poll Metalworking Men

STEEL—
Getting all you need?
YES—57% NO—43%

COPPER—
Getting all you need?
YES—53% NO—47%

ALUMINUM—
Getting all you need?
YES—63% NO—37%

If freely available, would you use more?
YES—63% NO—37%

In present application?
14% said YES

In new application?
26% said YES

STRIKES—
Would you favor a ban on strikes until workers vote for a strike in a fairly supervised election?
YES—96% NO—4%

NEW MATERIALS—
Are you using any of the newer structural materials listed below?
YES—48% NO—52%

If so, which ones?
Titanium 22%
Vanadium 16%
Zirconium 5%
Metal-Ceramic combination 7%
Molybdenum 26%

ening machine permits the user to choose the fuel best suited to his operations and local conditions. Natural gas use is attractive because it cuts costs both in original capital investment and operation. Working on a refrigerator crankshaft job the machine provided maximum hardness of a bearing diameter right up to the flange in a 12 second heating cycle with negligible distortion, well within grinding limits and without burning or cracking at the oil hole.

Among the more massive displays at the show was a welded base for the atomic cannon fabricated by Baldwin-Lima-Hamilton Corp., Philadelphia.

Extra wide, high speed welds made twice as fast as possible with a single electrode featured the Linde Air Products Co. exhibit. Parallel connection for electrodes on a HWM 2 Unionmelt machine enables the manufacturer to make a perfect weld on jobs where seams have gaps or other irregularities. Speed is 60 inches per minute.

Weighing only 150 pounds and measuring 15 inches in diameter and 11 inches long, a portable x-ray unit made by General Electric Co.'s x-ray department, Milwaukee, permits inspection of many castings and fabrications that formerly would have been impossible or at least difficult to handle. Unit operates continuously at any voltage from 75,000 to 250,000 volts, 2 to 10 milliamperes. Three models offered are stationary, movable by a bridge crane and portable mobile unit containing controls, cables, water cooler and tube head storage unit.

Equipment for using CO_2 as a machine tool coolant had a prominent spot in the exhibit of Air Reduction Co., New York. The cooling setup was demonstrated turning a type 309 stainless steel bar and directing the jet to the point where tool and workpiece make contact. Refrigeration effect is produced by releasing the high pressure carbon dioxide (850 psi at 70 degree F) to atmospheric pressure through a suitable nozzle. Various nozzles are available to produce desired spray such as cone, fan or pin point.

Titanium continues its fascination. Rem-Cru showed a continuous sheet coil of RC 70 rolled to 0.015-inches x 37 inches x 460 feet, valued at $12,000. Also on display was a television cone spun from RC 70, fabricated in a single operation and a jet engine cut away to show titanium applications.

Viewing Coiled Titanium

Visitors to the Metal Show at Philadelphia closely inspect a 37-inch-wide coil of titanium which would stretch 460 feet if unrolled. The producer, Rem-Cru Titanium Inc., Midland, Pa., believes this is the widest and longest strip of titanium yet manufactured. Rem-Cru is currently starting expansion of facilities which, when completed, will double its titanium production

Clinics on titanium forging, forming, welding, cold heating, machining and grinding packed them in for Titanium Metals Corp. of America.

New carbotrol unit for automatic control of furnace atmosphere was unveiled by Lindberg Engineering Co.

Attention-getter was mill housing of a Sendzimir reversing cold strip mill at American Silver Co.'s booth. This midget edition of the standard Sendzimir attains gage accuracies of plus - minus 0.0001 inch.

Two-product cold cleaning combination for removing drawing and cutting oils, rust preventive coatings and polar type smuts and soils from ferrous metals, copper and brass at room temperature in power washers was featured in E. F. Houghton & Co. exhibit.

NPA Approves Construction

Allotments of controlled materials for construction of 500 commercial, religious, municipal and entertainment projects throughout the country with an estimated cost of almost $100 million are announced by NPA. Over 600 applications, including 350 amusement and recreation projects are still to be acted on.

Approximately 50 per cent of the projects will receive their materials in the fourth quarter of this year, 40 per cent in the first and second quarters of 1953 and the remainder received their materials in the third quarter of this year.

Contrasting the $100 million just approved with the $626 approved during second quarter, NPA cites the impact of the steel strike on the supply of structural steel as responsible for the reduction.

AEC Enlists Civilian Aid

The Atomic Energy Commission is allowing more private companies to have a share in atomic work. Authorities in industry have expressed opinion that competitive conditions in the atomic energy program would spur advances in research and development.

Now the AEC expects to grant security clearances to the personnel of 11 companies which will be associated with Dow Chemical Co. and Detroit Edison Co. in their study for the development of a nuclear reactor to produce power. Research will be done in the national atomic energy laboratories at Oak Ridge, Tenn., Brookhaven on Long Island, N. Y., and at Chicago. Another group of companies has been engaged in research to develop a reactor to produce fissionable materials and power.

The associated companies will provide qualified workers to carry on the research. These men will function as regular employees of Dow or Detroit Edison.

Success of the AEC's program would accomplish several ends. The electric industry would remain abreast of developments in atomic work, the government would secure the advice of electrical engineers and new uses for metal products might well be discovered.

Schism in Washington

Lame duck officials are split on whether to act now on economic matters, especially relating to mobilization, or mark time until a new administration takes over

TO ACT or not to act is the question in Washington during the closing days of this lame duck administration and before the opening days of the new administration to be chosen in the Nov. 4 elections. Particularly affected is the mobilization program where decisions scheduled to be made now will affect business and production in the summer and fall of 1953.

One school among officials, including Commerce Secretary Sawyer, would like to clean up as much business as possible in the lame duck interim much of which hasn't been done in last four years. Another school of thought would leave the decisions to those who will come after.

Personnel Problems—The split in policy makes it difficult to get men to come to Washington and stay there to make the day-by-day decisions which must be made until yearend.

Defense Secretary Lovett said last week that, traditionally or by statute, budget requests must go to Capitol Hill 15 days after the new session of Congress opens. That means Defense Department budget requests must be approved now and justified by men who may not be in Washington when Congress starts hearings on the budget in February or March.

Who Will Do It?—Other questions are: What will be done to implement the new supply regulations issued by the defense secretary and handed to Munitions Board Chairman John D. Small to be administered? What will happen to the proposed reorganization of the Munitions Board which is intended to allow the Board to play a bigger role in the mobilization effort?

Pressing decisions wait to be made on matters ranging from the mobilization base to the price of copper and aluminum. There's the question of what kind of a control law, if any, will be needed next year. Congress will have to decide early in the session since the wage-price statute runs out on Apr. 30 and materials controls will be removed on June 30.

Who Will Answer?—Defense Mobilization Director Henry H. Fowler has asked for advice from each of the agencies, but how much responsibility can or will the agencies take under the present circumstances? And how much weight will those recommendations have?

Among the do-it-nowers, Commerce Secretary Sawyer seems bound to restore control over the National Production Authority, which up to now has operated in a quasi-independent fashion close to ODM and Defense Production Administration. All that is to be changed. Mr. Sawyer wants to create a Production and Distribution Bureau in which the bare bones of the NPA are to be placed division by division as they outlive their usefulness.

Down, Not Out—Mr. Sawyer is also pushing for decontrol. After a trip through the country last week, he said decontrol could come sooner than expected. That was particularly true, he said, of steel where recovery had been remarkable. Mr. Sawyer would keep the control machinery alive, however.

What is true of the mobilization program is equally applicable all over government. Perhaps the best proof of the unsatisfactory situation in Washington is that for the third month in a row employment of federal workers has dropped substantially.

Bethlehem Ups Pig Iron Output

Bethlehem Steel Co. is increasing pig iron production at its Bethlehem, Pa., plant by 25 per cent. First of two new blast furnaces is scheduled for completion in February, 1953, with the second stack due for construction shortly afterward. Both will have annual capacities of about 600,000 tons.

The Bethlehem, Pa., plant is currently casting and forging steel ingots of 361 tons each, for the production of 70-foot columns for a 25,000-ton forging press. Ingots are cast in a mold 134 inches in diameter.

Longhorn Resumes Tin Smelting

The Longhorn Tin Smelter at Texas City, Tex., is looking forward to a full year of capacity production, now operations are resumed after strikes and more than a year of ore shortages.

Ore stocks accumulated during the strike are sufficient for a year's output at the smelter's monthly capacity of 3470 tons refined tin, says A. L. ter Braake, president and general manager of Tin Processing Corp., which operates the smelter under authority of the Reconstruction Finance Corp.

Weldments: Can Sales Equal Last Year's?

Makers of weldments hope to equal or better 1951 sales by pushing hard in the fourth quarter. Question marks: Availability of steel plate and plant capacity

THE STAR of weldments is still in the ascendance. But weldment makers are keeping their fingers crossed when they say sales this year will equal or better last year's postwar record totals.

Better-than-last-year sales were looked for in 1952 until the steel strike came along. Now the fourth quarter and materials supplies will tell the tale.

Holding Gains—Paul Avery Jr., Avery & Saul Co., Cambridge, Mass., reports his shop more than doubled production last year and is holding to near capacity operations this year. Harold Williams, sales manager, Process Equipment Division, Blaw-Knox Co., Pittsburgh, says, "There should be between $500 and $800 million worth of process equipment (pressure vessels, tanks, etc.) bought this year. That's about the same as 1951."

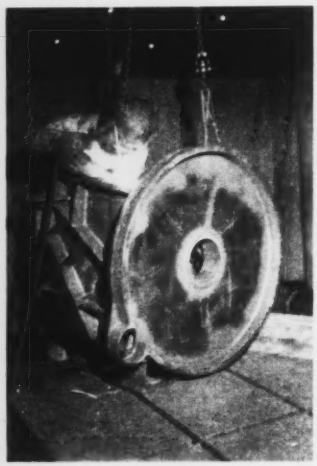
Weldment shops, as one of the leading users of heavier plate, depend greatly on defense-rated business, which runs from 80 per cent in some shops to 25 per cent in others.

None of them report trouble getting steel to cover rated orders. Many firms' sales records this year will depend, however, on how well steel plate comes through for the various defense-supporting classifications. Welding rod, the second major material used in weldments, is easier to get (see next story).

To the Limit—Nearly all the 150 large concerns which account for 90 per cent of weldment tonnage are operating at full capacity and extra shifts are limited only by the shortage of skilled welders. Some firms report they're still in the midst of large training programs for welders.

Pressure on weldment makers is expected to ease as the capital goods programs are completed. That's because so much tonnage in weldments goes to heavy machinery, like machine tool bases, stator and transformer frames, rolling mill equipment, pressure vessels and many heavy-duty components.

Reducing Method—The reason weldments are still on the up-



IMPROVED WELDMENTS
a strike victim recovers

grade is largely their increased acceptance as a weight reducer. Strongest trend, and where weldments show the greatest sales gains, has been in large weldments of special design. Generally, a weldment will save upwards of 50 per cent in weight without loss of strength, often with increased strength.

Improved inert gas shielded welding methods are the most important advancement in the field, says Edward Roper, Air Reduction Co., New York. They have contributed much to effective welding of jet engines and large structures.

Some structural steel fabricating firms, such as R. C. Mahon Co., Detroit, have gone into weldments in the last few years; some shops formerly engaged only in flame cutting have also gone a step ahead and are now making weldments.

Most established weldment firms, like American Welding & Mfg. Co., Warren, O., are too busy just now keeping up with defense work on combat tank, atomic energy and aircraft programs to worry about any possible future declines. They see improved welding techniques, better equipment and progress in welding nonferrous alloyed metals and various combinations of dissimilar metals portending sky-high, though not meteoric, prospects.

Welding Rod Shipments Improve

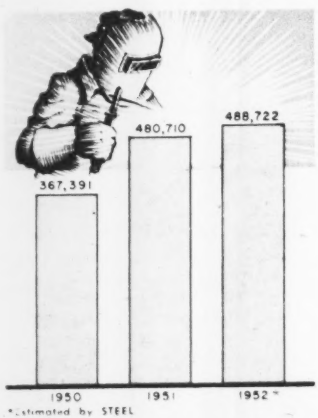
Welding electrodes are exhibiting as much bounce-back from the steel strike as any steel product. Dependent on steel wire, which is in very easy supply, welding rod shipments in 1952 will probably exceed last year's shipments by a comfortable 8 million pounds (see the graph below).

That's despite first-eight-month totals which were: For 1952 305,612,566 pounds; for 1951 314,247,525 pounds; and for 1950 221,987,493 pounds.

W. B. Browning, chief, Welding Section of the National Production Authority, notes there were over 40 pounds of welding rod produced for every ton of key steel products (plates, shapes and structurals) in each month from March, 1952, to June, 1952. Production fell off during the steel strike, of course, but Mr. Browning believes the wartime ratio of 40 to 50 pounds of electrodes for each ton of key steel product will be regained in the fourth quarter.

Barring unpredictable hitches, welding electrodes should return

WELDING ROD SHIPMENTS
Annually in Thousands of Pounds



*Estimated by STEEL

to their normal position as a stock item within a few months. Some dealers now report backlogs as high as 6 to 9 months.

Founders Elect Trenkamp

H. J. Trenkamp, Ohio Foundry Co., Cleveland, was chosen president of the Gray Iron Founders' Society, Inc. at their 24th annual meeting in Cleveland. Other officers include: T. I. Curtin, Waltham Foundry Co., Waltham, Mass., vice president; W. O. Larson, W. O. Larson Foundry Co., Grafton, O., treasurer; and C. H. Ker, Dalton Foundries, Inc., Warsaw, Ind., secretary.

The foundrymen heard Dr. George W. Taylor, professor of labor relations, Wharton School, University of Pennsylvania, Philadelphia, say that management must take the initiative in building sound labor relations. "Management weakens its position by seeking government help in labor relations," says Dr. Taylor.

Big Boost for Small Business

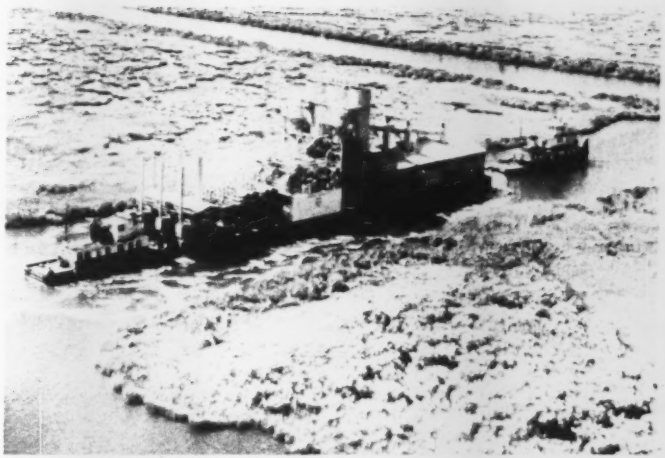
Small business will be sure of its proper place in the national defense expansion program under recently announced plans of the Small Defense Plants Administration in tax write-offs.

SDPA expects firms employing less than 40 workers to furnish 30 per cent of the goal of $50 million in additional capital investment in industrial valves and fittings. This goal is set for July 1, 1955. Of the total expansion, certificates of necessity have been granted for $29 million and applications received for an additional $14.6 million.

SDPA hopes to find qualified firms with capacity for producing steel valves, turbine valves and large butterfly valves.

The small plants expansion goal for steel strapping is 10 per cent of the national program. Firms employing less than 200 persons are asked to produce at an annual rate of 550,000 tons by Jan. 1, 1955. This goal is an increase of 150,000 tons over the rate on Jan. 1, 1951.

Certificates already have been issued to cover 88,800 tons of the increased production.



Floating Mine Hunts Undersea Sulphur

A floating sulphur mining plant, built atop a 200-foot steel barge is shown as it is towed 65 miles from Grande Ecaille, La., where it was assembled, to Bay Ste. Elaine in the Louisiana marshsland. STEEL, Feb. 25, p. 50, pictured beginning construction of the plant under direction of the Freeport Sulphur Co. of New Orleans. Water heated in the plant will force out sulphur under the sea floor

Fuel Supplies: Weather's the Big *If*

Fuel supplies are heavier than last year, adequate for a "normal" winter. But prolonged or severe cold snaps could hurt, particularly in gas. Then there's Mr. Lewis—

FUEL COMPANIES know that their stocks of gas, coal and oil are heavy and will be ample for a "normal" winter. But the uncertainties of the weather on demand are confounded by Mr. Lewis' penchant for storms in supply.

Most users of coal report two- to three-month inventories, heavier than usual pre-winter levels. But a long coal strike or a long cold spell could bare stockpiles by mid-January. Probability of either occurrence is remote; both are equally unpredictable. Results of either: Drain on other fuels.

Gas Vulnerable — Most vulnerable will be the gas users. Though gas storage tanks are filled within a burp of the top and supplies are larger than ever, ability of a gas company to deliver is predicated on the pressure in its storage tanks. If cold snaps reduce pressure early in the winter and no mild weather intervenes to permit rebuilding it, moderate cold in February could precipitate a shortage.

Residential users have priority if a shortage occurs, so most gas companies urge their industrial customers to install standby equipment. Some even study the customer's product and determine what substitute fuel will best serve where undesirable chemical reactions can occur. Result is that most plants now have standby facilities for their critical operations and any gas shortage isn't expected to cripple production.

Well Oiled—Coziest of all will be the users of fuel oil. There was a drop in fuel oil prices some weeks ago testifying to the generally easy situation. Bunker oil is becoming a drug on the market in Texas and some producers are planning further refining to give them a profit.

With increased petroleum storage facilities and higher supply levels, oil users should have a comfortable winter in any eventuality. Coal and gas users will have fires this winter, but as usual, they won't be able to relax by them.

General Electric Co. lays the groundwork for nuclear study as this saucer-like foundation for a spherical laboratory heralds . . .

New Sphere for Atomic Development

THOSE SPHERICAL STEEL structures common to the chemical and petroleum industries may be only little brothers to industry's nuclear power plant of the future. On a site only 18 miles from Schenectady, N. Y., a 220-foot diameter sphere of 1-inch steel plate is being constructed to house a nuclear reactor for a submarine power plant. The reactor will utilize molten sodium metal as a heat transfer medium and is the first built near a settled community.

The project, known as SIR (for Submarine Intermediate Reactor), is under direction of the Knolls Atomic Power Laboratory, operated for the Atomic Energy Commission by General Electric Co.

Safeguard Needed—To enjoy the obvious advantages of building nuclear power generators near the point of industrial use, absolute safeguards to nearby communities must be devised. Atomic scientists think the steel sphere is the answer. It's a last line of defense to prevent escape of radioactive gasses in case all other controls fail. Spherical design was determined to be the optimum shape for containing required volume at least cost.

Construction of the spherical building to house the reactor is being handled by Chicago Bridge & Iron Co. under a $2-million direct AEC prime contract. Service buildings will cost $5-8 million. Supporting structure for the sphere is now in place. Foundation for the sphere is a concrete saucer of 179-foot diameter and 12 feet deep. In its center is a tower and derrick reaching 121 feet above ground level. On the site huge jigs hold 9 x 32 foot curved plates for machine welding into 35 x 32 foot sections that gird the sphere at its center. Bottom then top sections will be added. Every weld must be x-rayed to assure against leaks.

The Reactor — The submarine's power plant and hull will be built by Electric Boat Division of General Dynamics Corp. After the building is completed and tested, the hull section, which is being assembled just outside, will be "launched" or slidded into the sphere by removing a section of the wall and then resealing it.

One of the basic differences between SIR and the power plant for the 20 knot-plus submarine *Nautilus*, abuilding at the Idaho National Reactor Testing Station is in tackling the heat transfer problem. Water is the ultimate heat transfer medium in both reactors, but the *Nautilus'* thermal reactor slows neutrons quickly. SIR will try an intermediate step that utilizes liquid sodium circulated by a 37-psi electromagnetic pump. Heat from the reactor ultimately is used to generate steam that drives a turbine.

Urgent — The Navy is pushing this program so hard because the nuclear process is not dependent on oxygen. This means subs without Snorkels and bulky air tanks. Refueling time would be slashed, submerged speed higher and range would be limited only by the physical endurance of the crew.

The prototype sub is land-based because test operating at sea would be out of the question at this time. Utilizing favorable experimental conditions at the laboratory site, says K. R. Van Tassel, general manager of KAPL's operating department, "will shorten the time a seagoing unit can be turned over to the Navy."

Small Business Awards Climb

Defense contracts earmarked for small business have now passed the $125-million mark, says Small Defense Plants Administration. Under the agency's "joint determination" procedure 19 contracts valued at $28.7 million have been awarded to small companies since the program's inception last May.

The "joint determination" program was established by SDPA and the Armed Forces to screen proposed contracts for small business possibilities. Under this program SDPA officials in procurement centers screen all but highly-classified proposed procurement above $25,000. These officials then ask the Armed Forces to earmark certain contracts to small business exclusively.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Gun Parts & Mounts	Hunter Mfg. Corp., Bristol, Pa.
Gun Parts & Mounts	Northern Ordnance Inc., Minneapolis
Aircraft Indicators	Hazeltine Electronics Corp., Little Neck, L. I., N. Y.
Aircraft Indicators	Robertshaw-Fulton Controls Co., Youngwood, Pa.
Auxiliary Power Units	Continental Aviation & Engineering Corp., Detroit
Generators	Bogue Electric Mfg. Co., Paterson, N. J.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this Checklist on Controls. For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administration Services Division, Temporary E Bldg., Washington 25.

Materials Orders

COPPER—Amendment of Oct. 17, 1952, of NPA Order M-11 permits copper controlled materials producers to use allotment symbol PM in self-certification procedures and eliminates the necessity of their filing CMP 4B applications to obtain, during any calendar quarter, the minimum quantity of other production materials required for incorporation into the copper controlled materials scheduled for production in that quarter. It also revises the list of materials excluded from the definition of brass mill products. It was effective Oct. 17.

COMMUNICATIONS—Amendment of Oct. 17, 1952, of NPA Order M-77 extends, during April, 1953, to telephone systems comprising less than 15,000 instruments the self-authorization privilege heretofore given to operators of telephone systems comprising less than 5000 instruments. After Apr. 30, 1953, a larger self-authorization privilege is given to all operators of systems comprising less than 15,000 instruments, and larger operators are permitted to self-authorize for small operating construction projects.

ALLOY IRON—Amendment 3 to NPA Order M-80, issued and effective Oct. 21, 1952, adds alloy iron to the alloys described in the order and defines it as any iron (cast or pig) containing one or more of the elements defined in List 1 of M-80 in any amount specified or known which has been added to obtain a desired alloying affect.

Price Regulations

RADIO, TV PARTS — Amendment of Oct. 15, 1952, of Revision 1 of General Overriding Regulation 5, effective immediately, delays the effective date of Amendment 7 of Revision 1 of GOR 5, which recontrolled ceilings on radio, television and phonograph parts, from Oct. 15 to Oct. 27.

SMALL MANUFACTURERS—Amendment 38 of CPR 30 and Amendment 1 of CPR 150, both issued and effective Oct. 17, 1952, exempt from price control manufacturers of machinery and related manufactured goods, and manufacturers of small pneumatic compressors whose annual gross sales do not exceed $25,000.

IRON, STEEL SCRAP—Amendment 11 of CPR 5, issued Oct. 17, 1952, and effective Oct. 22, under certain circumstances permits some minor deviation from the precise specifications set forth in CPR 5 prohibiting inclusion of nonferrous metals or foreign material in iron and steel scrap.

Rx MANAGEMENT CLINIC

KNOW HOW TELLS HOW industry solves its problems. Metalworking executives will be interested in reading YOUR comments on the problems or opinions expressed

Foremen Feuding

● "Foremen feuding" often arises from management's stressing turn performance instead of departmental or divisional performance over the 24 hour period. Turn performance must be watched closely from the standpoints of efficiency and productivity, but major emphasis must be placed on how the division performs.

Such emphasis tends to develop in the foremen a stronger spirit of cooperation through instilling in them pride in their department's accomplishments, but it is not easily accomplished since they are by nature competitive. Regardless of how good a man the foreman is individually on his job, failure to co-operate with his fellow foremen to assure good departmental performance makes him an obstacle in the path of progress and his removal may be found necessary.

As a result of the great emphasis placed in recent years on "labor relations", management, in many instances, has failed to notice that the problem of "foreman relations" has been growing acute due to pure neglect.

A. E. KADELL, Manager
Tin Plate Dept.
Weirton Steel Co.
Weirton, W. Va.

● Feuding employees, regardless of cause, are immature personalities and as such act and think with the same poor judgment and illogic as fifteen-year-old adolescents.

Each secretly hopes the other will be discharged, with no sensible realization that his own actions make himself a less valuable employee.

Knowing these facts, call both parties into the office and lay the facts on the table—their value as individual employees, their uselessness as a team. Then tell them you will give them 30 minutes to settle their differences and agree they will stay settled, and if they cannot do that they are both through.

Leave the office, and in far less than 30 minutes they will be together and a real team will have been born.

PAUL H. SETZLER
Baldwin-Lima-Hamilton Corp.
Hamilton, O.

● I would invite both of these men to be my guests for lunch at a very early date, and would proceed to tell them how valuable I consider them on their jobs, but that their petty grievances between themselves were costing me production time, and regardless of what they may think they are doing to the other fellow, it is I who is footing the bill.

I would hope that they could patch up their troubles so that our company could really appreciate their shop-savvy.

THOMAS J. JEFFERS, Supt. of Mill
Phoenix Iron & Steel Co.
Phoenixville, Pa.

Missing Tools

● Part of the reason for the loss of tools through pilfering is the sheer bulk of tool handling in the modern plant. Toolroom attendants handle so many tools and distribute them to so many workers the clerical problem invites loss.

Companies that have the problem might well consider subdividing their large toolrooms into several smaller toolrooms spotted throughout the plant. Not only would the toolroom attendant be able to know more intimately the workers to whom he was giving tools, but the volume of tools handled would be considerably reduced.

C. S. MORGAN, Vice President
Chandler Chemical Co.
Cleveland, O.

THIS WEEK'S PROBLEM

"We have a capable screw machine mechanic in most ways, but he has one quirk. Every time he gets stuck on a job he blames the cutting oil. Usually he's blaming the cutting oil for his own reluctance to find the right tool grind for the job. He isn't a lazy man, but he uses cutting oil as a crutch when he runs out of ideas on a tough job.

"Changing the oil in a screw machine takes valuable time and delays getting at a real solution of the cutting problem; yet no matter how many times we try to show him the oil isn't at fault, the next time he runs into trouble it's the cutting oil again. How can this man be shown once and for all?"

Send your comments to "Management Clinic", STEEL Magazine, Penton Bldg., Cleveland, O.

Windows of Washington

CMP may be retained as a reporting device after controls are ended . . . Munitions Board reorganization is bogging down . . . Machine tool companies will increase employment

THE NEED to maintain CMP as a reporting device after controls are lifted is under serious study. Some of the mobilization planners who are working on the production base needed to support full M-Day requirements argue that the reporting system will have to be maintained so as to determine basic consumption patterns for steel, copper and aluminum.

This information, they say, would be invaluable in determining how much of hard goods capacity could be turned over to the military and how much would have to be saved to meet the hard core of civilian and industrial requirements—housing, schools, roads and the like.

The answer could depend on what the next Congress does to the Defense Production Act now scheduled to expire on June 30.

Tool Employment To Rise . . .

Machine tool companies will increase employment between now and the middle of January, despite dwindling order backlogs. A survey of 198 companies, including all employing more than 50, indicates total employment will rise 4 per cent.

Half of the companies reporting to the Labor Department indicate they are experiencing difficulty in obtaining qualified men, although the majority say the manpower situation has eased considerably since the first of the year.

GSA Buys Domestic Beryl . . .

A program designed to uncover new domestic sources for beryl is getting underway under direction of Jess Larson, administrator of General Services. The government will buy domestic beryl in small lots at three purchase depots at Spruce Pine, N. C., Custer, S. Dak., and Franklin, N. H. Material purchased must contain not less than 8 per cent beryllium oxide by weight. Base price will be $400 a ton.

The United States now obtains 90 per cent of its beryllium from abroad. An alloying material, generally used with copper, beryllium is important in the production of springs, diaphragms and other parts subjected to constant flexing and high temperatures.

Money, Root of Good?

NPA infers that it's concerned about the harried businessman. It explains that self-certification limits have been hiked for small users of controlled materials in B-products in a move to help him. It explains that granting automatic allotments to middle-sized users will save time and paper.

It announces that as a result of this conscientious effort, the agency will only handle 12,000 applications for B-products controlled materials in the first quarter of 1953 compared with 27,500 in the fourth quarter, 1951. It points out savings to the taxpayers will result from handling all CMP applications in Washington in the future rather than in Commerce Department field offices.

It doesn't point out that Congress cut its budget. Is NPA taking to heart the problems of the businessman or the problems of the budget cut?

Now Heavy Die Problems . . .

The National Production Authority is planning to name a technical committee to study the problem of producing the die blocks needed for the heavy press program. The committee would be composed of technicians from the six die block manufacturers and the press operators. The problem: How to cool and harden the steel needed in the big presses.

Munitions Board Bogs . . .

The reorganization of the Munitions Board to meet new responsibilities in connection with the supply regulations is temporarily bogged down. Part of the trouble is that Munitions Board Chairman John D. Small got no authority to redelegate any of his new power obtained in the charter from Defense Secretary Robert A. Lovett.

The reorganization is supposed to be on functional lines and to eliminate many of the bottlenecks which make the Munitions Board ineffectual. However, part of the trouble stems from the composition of the Board as set up by the Congress—it is composed of an under secretary of each of the three services, and not of the Defense Department itself. It could take legislation to make the Board effective.

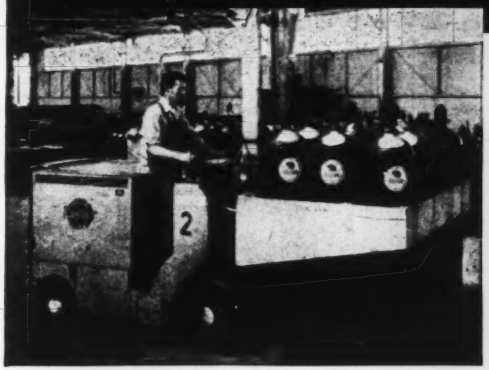
Now, Defingerprinting . . .

Hollingshead Corp. and Viscosity Oil Corp. have been approved as suppliers of the new unified fingerprint remover specification of the armed services and samples submitted by other manufacturers are under test.

A lot of damage was sustained to metal parts and assemblies during World War II from sodium and calcium salts and butyric acid placed on them by the hands of workers. Each service developed its own treatment which now, following considerable research, is supplanted by a single simplified approach.

The new product, identified as "MIL-C-15074A, Compound, Corrosion Preventive, Fingerprint Remover," is a dual-purpose, petroleum-base compound which removes fingerprints upon application and subsequently leaves a preservative film.

DOW CHEMICAL saves thousands of dollars annually with *BAKER TRUCKS*



Baker Fork Truck with Trayner-Reinhart cylinder carrier easily transports twelve 16" cylinders.

At the Pittsburg, California, plant of The Dow Chemical Company, five Baker Fork Trucks expedite handling of material in production, storage and shipping departments.

Two of these trucks, one of them fitted with a Trayner-Reinhart cylinder carrier, transport 16" cylinders of ammonia—twelve at a time—from production to warehouse and from warehouse to shipment. Trucks load cylinders directly into boxcars, or onto highway trucks.

The remaining trucks speed handling of chemical products in bags or cartons on pallets—taking them from production to storage, where they are high-tiered to conserve floor space, and from storage to shipment, where further man-hour savings are made in loading.

Prior to the installation of the Baker Trucks, material was transported manually and hand-stacked. Cylinders were rolled by hand, one at a time. The use of the trucks has resulted in savings of thousands of dollars annually over former methods.

Bagged material, stacked on pallets as it comes from the line, is tiered to the ceiling in storage. Cartons of finished chemical products are handled in pallet loads to save manual handling in transporting, storing, and car or truck loading.

Documented Case Histories showing actual savings with Baker Trucks in some of America's best known companies are yours for the asking. Use coupon below.

The Baker-Raulang Company
1259 West 80th Street, Cleveland 2, Ohio

Please send me case study reports showing savings with Baker Trucks.

Name ..... Title .....

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Baker
INDUSTRIAL TRUCKS

DEPENDABLE EXTENSIVE

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WASHERS

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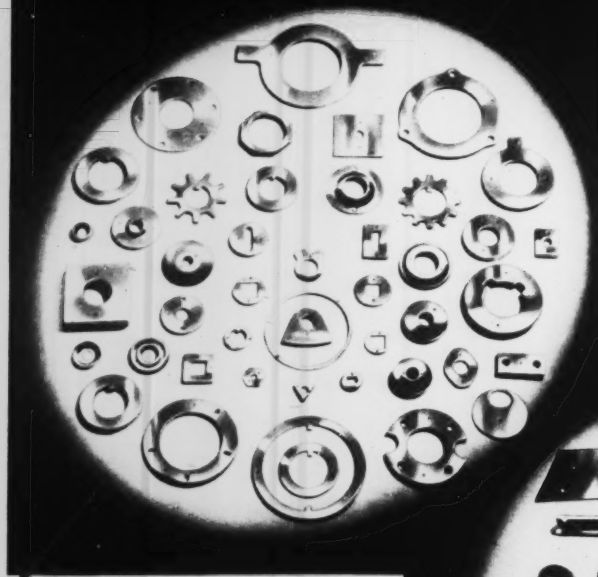

Washers are stocked in thousands of different sizes, including all standard and semi-standard sizes. If your requirements cannot be met from this extensive inventory, more than 22,000 sets of dies are available to take care of special orders, or we will make up dies to meet your individual needs. *Write for Catalog "30" — 76 pages covering full line of washers, tool list for producing washers, helpful reference tables and other data.*

STAMPINGS

Large scale production facilities enable us to effect worthwhile savings, in many instances producing stampings more economically than possible in our customers' own plants. Our own tool and die-making shop enables us to make up dies necessary for producing new stampings, working directly from your blueprints.

Let us quote on your requirements . . . covering fabrication in any material and in any finish. Furnished machined, heat-treated or surface ground, as may be specified.

WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

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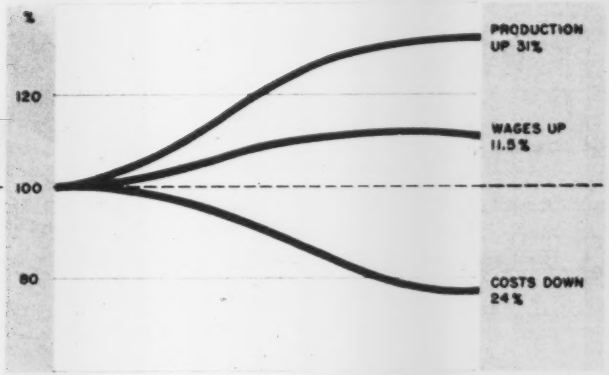
STEEL

A MANAGEMENT TOOL

Manufacturing Cost Control

By E. H. ANDERSON
Management Consultant
Harold F. Howard Co.



Performance curves show what was achieved by a metalworking plant during an 18-month period of instituting adequate cost controls.

XYZ MFG. CO., a specialty and general machine shop, had increasing volume but shrinking profits.

Analysis showed excellent technical and methods background and some direct labor control supported by an adequate time study department that was unable to obtain proper co-ordination from management.

What to do? In this case a manufacturing cost control program was instituted. As the accompanying chart attests, production at the end of 18 months was increased 31 per cent, wages 11.5 per cent and costs decreased 24 per cent.

Survival of any firm in metalworking today depends directly upon the knowledge by top management of true product costs. Many companies are in a dangerous financial condition because their true over-all manufacturing costs are unknown to them and they cannot price their products in an intelligent manner to meet competition at a profit.

Heavy taxation has added to the need for knowledge of actual costs. In the period ahead management's decisions may determine the survival or failure of only a partially healthy company. And even those managements who operate an essentially healthy company need to be constantly on the alert not to overlook a single opportunity to widen the gap between cost and selling price.

Adequate manufacturing cost control is one of the most important facilities metalworking management can provide to insure survival. It is the only management tool available to chart a company's course intelligently and determine results before money is spent. If cost controls are properly established they can sound a warning in sufficient time to effect corrective measures in areas of known specific weakness.

Cost procedures in many small and large metalworking plants today are inadequate to develop even satisfactory estimates. And as a result, they fail to obtain contracts because their quotations are too high. Sometimes they get the contracts and then suffer losses because they overlooked important cost elements.

What is Cost Control?

Manufacturing cost control can be defined as: The guidance and regulation of the internal operations of a business by means of modern methods of allocating material, labor and burden costs. A closer scrutiny of this definition reveals that manufacturing cost control is strictly a matter of executive action. Such controls, to be effective, require executive action based on information obtained through analysis. Actually analysis and control present a typical cause and effect relationship.

Cost analysis for managerial purposes is the comparison of actual with predetermined or anticipated costs; to find what variations have taken place, their extent and causes. Also the conditions underlying each specific cause must be determined to enable management to develop or revise policies relating to facilities, manpower and organization that will correct all unfavorable conditions.

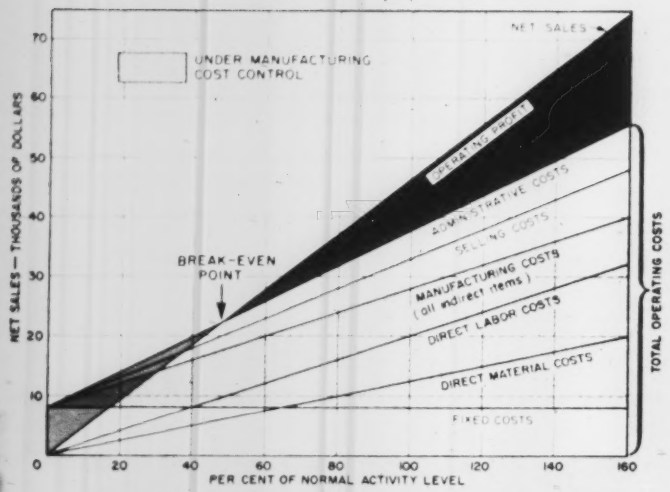
Selling prices should be based on cost plus a fair margin of profit. To enable manufacturers to do this instead of following the somewhat common practice of only meeting competition, break-even charts are usually compiled based on sales volume and per cent of normal activity levels.

The part that manufacturing costs play in this all-important performance chart can be seen on p. 54. Administrative and selling costs can be allocated and controlled satisfactorily by conventional accounting systems. But if the same simple system is applied to manufacturing costs, details get out of hand and excessive charges cannot be located or corrected. Thus, manufacturing costs are usually the most important factor in the break-even point of a company.

How It Works

There are five steps to assure that a manufacturing cost control system will work:

1. Set up standard costs based on assumed maximum attainable efficiencies. This is the most time consuming and important phase of cost control work. Costs must be



A break-even chart, above, of the common type used by modern industrial firms to chart costs. Below, a typical cost control report form. In actual practice, only the account numbers are used, with more space devoted to "Reasons."

MONTHLY COST CONTROL REPORT

Month of _____ 19__

Department No. ____ — Machine Shop

Account No.	Account Name	Actual Budget	Variance + or −	Reason for Variance
1000	Foreman, Machine Shop			
1001	Assistant Foreman			
1002	Clerk			
1003	Time Study Man			
1004	Lost Time Waiting for Material			
1005	Lost Time Waiting for Tools			
1006	Lost Time Waiting for New Set-up			
1007	Lost Time Waiting for Inspection			
1008	Lost Time Machine Repair			
1009	Lost Time Tool Repair			
1010	Lost Time Accident			
1011	Miscellaneous Labor — Machinery and Equipment			
1012	Miscellaneous Labor — Jigs, Fixtures			
1013	Moving and Transporting Labor			
1014	Overtime — Night Premium			
1015	Overtime — Overtime Premium			
1016	Vacation Pay			
1017	Sick Leave			
1018	Holiday Pay			
1019	Welfare Work			
1020	Washing and Polishing			
1021	Miscellaneous Materials — Machinery and Equipment			
1022	Miscellaneous Materials — Jigs, Fixtures			
1023	Miscellaneous Materials — Tools			
1024	Miscellaneous Materials — Machine Repair			
1025	Miscellaneous Materials — Tool Repair			
1026	Miscellaneous Materials — Inspection			
1027	Miscellaneous Materials — Set-up			
1028	Miscellaneous Materials — Waiting for Material			
1029	Miscellaneous Materials — Waiting for Tools			
1030	Miscellaneous Materials — Waiting for Inspection			
1031	Miscellaneous Materials — Waiting for Set-up			
1032	Miscellaneous Materials — Waiting for Machine Repair			
1033	Miscellaneous Materials — Waiting for Tool Repair			
1034	Miscellaneous Materials — Accident			
1035	Miscellaneous Materials — Vacation Pay			
1036	Miscellaneous Materials — Sick Leave			
1037	Miscellaneous Materials — Holiday Pay			
1038	Miscellaneous Materials — Welfare Work			
1039	Miscellaneous Materials — Washing and Polishing			
1040	Miscellaneous Materials — Moving and Transporting			
1041	Miscellaneous Materials — Overtime Premium			
1042	Miscellaneous Materials — Night Premium			
1043	Miscellaneous Materials — Foreman			
1044	Miscellaneous Materials — Assistant Foreman			
1045	Miscellaneous Materials — Clerk			
1046	Miscellaneous Materials — Time Study Man			
1047	Miscellaneous Materials — Inspection			
1048	Miscellaneous Materials — Miscellaneous Labor			
1049	Miscellaneous Materials — Miscellaneous Materials			
1050	Miscellaneous Materials — Miscellaneous Supplies			
1051	Miscellaneous Materials — Miscellaneous Expense			
1052	Miscellaneous Materials — Miscellaneous Overhead			
1053	Miscellaneous Materials — Miscellaneous Other			
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1099	Miscellaneous Materials — Miscellaneous Other			

broken down on a detailed account number basis for each product and each component so that all facets of manufacturing a product or line of products can be accounted for. Further, in setting up the system of standard costs, methods and labor standards must be brought up to the latest practice as well as routing, planning and scheduling operations. If the system for standardizing costs is realistic, well devised and kept up to date with the latest procedures, control of manufacturing costs can become routine.

2. Provide a system of reporting department costs on each component to a cost clerk. The successful performance of a control system depends upon the thoroughness with which each cost detail is reported. Accuracy and honesty play a great part in cost control procedure.

3. Prepare a cost control report monthly in triplicate showing deviations from standard costs. The cost clerk makes out this form based on standard cost figures and actual performance figures. Much attention to detail is required in preparing this form as an adequate cost control sheet that covers only one department can have as many as 30 different account numbers, as seen at left.

4. Send one copy of the control report to top management and another to supervision. The cost clerk keeps one copy for his record. Supervisors fill in the reasons for variations and send their copy to top management.

5. Study the variance report and take executive action. The corrective measures undertaken by executive action may require meetings with supervision, readjustment of standards (either up or down) or merely a pat on the back for a job well done. In any event manufacturing costs are given a thorough study each month by top management, and important decisions do not have to be made in the dark. Responsibility for cost variations is well defined and "buck-passing" sessions can be avoided.

A metalworking plant that has instituted an adequate system for reporting and controlling manufacturing costs soon finds that esti-

mates on new products can be easily projected. Contingencies can be accurately predicted and seemingly unimportant cost items that can make or break an organization are brought into the open.

The Monthly Report

A typical cost control form as shown on p. 54 is made up for each department in the manufacturing organization. How departments are broken down for the control system depends on the type of manufacturing organization and the various functions it performs.

In the form shown, the machine shop, Department 168 in a typical manufacturing plant, has an individual control sheet. The items shown such as Cost and Payroll-Factory, General Labor and Grievance Pay are not usually shown by name on the form but rather the numbers, 168-402, 168-410, etc., are used instead for simplicity.

Four columns are provided opposite the various account numbers. Each month the cost clerk fills in the actual cost, budget cost and variance. Supervision in the machine shop fills in the reasons for specific variances.

Costs are broken down in detail in this cost control form. And this is a must. The usual error made by manufacturing organizations when they set up for manufacturing cost control is that they establish account numbers for only indirect labor, repairs and maintenance, freight, insurance, rent and taxes. How much farther it is necessary to go in breaking down account items is evident from the items listed in the cost control form.

What Control Can Do for You

The following are typical examples of poor manufacturing practices that have been spotted and corrected by adequate systems of manufacturing cost controls:

1. Poor Materials Handling and Fabricating Techniques. A cost control study in a steel fabricating plant revealed that high indirect labor charges were being incurred through poor material handling techniques and fabricating methods. New labor standards, which resulted from improved material handling and fabricating techniques, were established. Direct labor costs were ultimately reduced 7 per cent, resulting in a $37,000 saving.

2. Overtime Charges. Analysis of the indirect labor expenses of a large production plant revealed overtime charges in excess of $375,000 per year. By forming better working teams and controlling allocation of activities such as setup and housekeeping, overtime charges were reduced 75 per cent or about $200,000.

3. Excess Idle Time. In a medium-sized plant it was found that direct labor employees were turning in excess idle time. Analysis showed that idle time was being charged to a "catch-all account," which included such items as rework and setup.

A new cost-reporting accounting procedure that gave a more accurate picture of the reasons for the idle time was instituted. Items such as waiting for material, waiting for a new job, inspection shutdown and tool and die repair were added to the cost accounts, with rework and setup given separate accounts. As a result, direct labor charges were reduced and corrective measures applied to cut the indirect labor charges that were revealed by the more detailed cost breakdown.

4. Dishonest Employees. A cost study of a semi-production and job shop showed a large volume of scrap material sales. Poor operational planning was indicated. Further study revealed, however, that poor planning was intentional and that certain employees were in collusion with the scrap dealer. Close scrap controls cut scrap sales, and made for honest employees. As a result a leak of over $2500 a month was stopped.

5. Losses in Small Tools. Cost controls in a job shop showed heavy small tool expense. A check into the reasons showed that employees were helping themselves to meet their small tool needs. A check system and issuance of a tool box to each employee saved the company nearly $1000 a month.

So, manufacturing cost control can mean more money in your corporate coffers. It can bring you another dividend, too. A few managements have successfully tied cost control procedures in with employee incentive and or profit-sharing plans. This makes for excellent employee relations and can often guarantee results and co-operation in controlling costs.

WHO CAN HELP APPLY COST CONTROLS

WORKERS—to save on spoiled material, scrap and indirect supplies.

TIME CLERKS—to find work that requires too much time or material.

PROCESS CLERKS—to locate interference points where costs pile up.

FOREMEN, other shop executives—to discover inadequate production methods and idle machines and to improve equipment maintenance and flow of work.

COST CLERK—to carry out general policy of cost department.

TIME STUDY MEN—to readjust piece rate scale on basis of better production methods.

ENGINEERS, technical staff—to improve planning, routing and scheduling.

INSPECTORS—to learn the reason for rejects.

SUPERINTENDENT—to co-ordinate the program.

When a high-strength steel is needed

for severe cold-formed shapes like these bumpers

Specify → **N-A-X** HIGH-TENSILE STEEL

and get all of the requirements of SAE 950

When a material meeting the requirements of the high-strength, corrosion-resisting steels of SAE Specification 950 is used for severe cold-formed shapes, it will pay to investigate N-A-X HIGH-TENSILE steel—the low alloy steel with *built-in formability*. Its finer grain and higher hardness also result in brighter luster when ground and polished for plated parts.

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division
Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

By H. C. TUTTLE Detroit Editor

Mirrors of Motordom

New 1953 Dodge Reaches Showrooms

A new model in the 1953 Dodge line is the gleaming Coronet four-door sedan shown above in Detroit. Already on display in showrooms, it represents a considerable change from previous models. Headroom has been increased, yet the new Dodge is more compact. A 140-hp Red Ram engine furnishes power while a gyro-torque drive speeds pickup. A special gear aids passing on the highway

Military vehicle production is nearing the goal set for it. By the middle of next year the entire ordnance program will be on a plateau

DETROIT

ALTHOUGH the fanfare has died down, production of military vehicles is nearing the peak rate set up by the authorities. The bulk of the vehicle orders are already close to that figure and by the middle of next year the entire ordnance program will have arrived at its plateau. In the tank program, for example, 21 out of 30 plants which are involved are now completed and in production. The rest will come into operation next year.

This is the situation told by Col. George W. White, who for four years has headed the mobilization planning branch of the Detroit Arsenal and the Ordnance Tank Automotive Center. To establish a suitable production base for automotive ordnance items, it has been necessary to spend about $1 billion for facilities and tooling.

Firm Foundation—The foundation on which military vehicle production now rests involves about 25 companies which are prime contractors. And Colonel White estimates that those which have tank contracts depend upon an average of 3000 subcontractors each. In setting up this base the facilities have been arranged so that production on the scale which would be needed in event of allout war can be obtained with a minimum time lag. Of course, it couldn't be an overnight job to increase production to that extent but within the lead-time requirements the facilities now designated could increase their production to the level the mobilization experts have determined would be necessary.

An instance of how they have planned for this possibility is offered by Colonel White. The T-48 medium tank is now produced with a one-piece cast hull. Because of the demands which would be made on the limited foundry capacity available for this size casting in event of total war, the ordnance designers worked out several alternates, some requiring smaller cast sections and others combining rolled plate and cast sections. This tank, incidentally, will come into progressively larger production as the makers of the M-47 medium, which is currently at peak, phase it out beginning next May and cease its production entirely by the end of next year.

Green Light Ahead—The T-41 light tank, being produced in quantity by Cadillac in Cleveland, is expected momentarily to be given army field forces approval, the colonel reveals.

He notices a decided change in attitude toward the military program on the part of many companies which initially were cool. A complaint now voiced is that there is not enough military business, rather than that it interferes with the normal civilan work. The original disinterest of some companies, however, has resulted in their being placed in the mobilization plan only in the event of full-scale war. Four companies, capable of making tanks, are on tap on this basis, he said.

Mission Accomplished — Colonel White's mission of building a large production base for combat and transport vehicles now has been completed, he feels. From the Ordnance Tank Automotive Center he is going to Heidelberg, Germany, where it is presumed he will be deputy chief to the chief ordnance officer in that command with responsibility for maintenance and supply in that area. His transfer will take effect about Nov. 1.

Head Start for DeSoto

The steel strike had its good points. It enabled the DeSoto division of Chrysler Corp. to make its model change this month with only limited production loss, whereas without the steel strike the enormous task of replacing or substantially altering more than 1200 tools, fixtures, conveyors, gages, etc. for its completely new body

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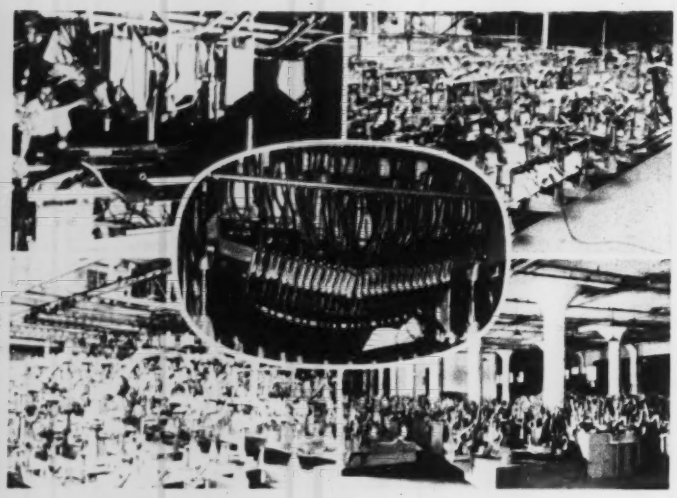

De Soto Production To Switch into High Gear

Production of the renovated 1953 De Soto body requires replacement or alteration of more than 1200 fixtures in De Soto's Detroit plant. At the upper left, workmen check a welder. Body fixtures stored until production of the 1953 model begins are shown upper right and lower left. At lower right, side panel fixtures await installation. In the center a workman checks a welding assembly fixture

would have meant a shutdown of several weeks.

The unique thing about DeSoto's activities in the Detroit body plant when lack of steel shut it down was not that it then completely converted the plant for the new body, but that it reconverted to its 1952 equipment in order to get its quota of that model produced. Calling it a "dress rehearsal," DeSoto put into pilot production all 1953 body components and assembly fixtures. After this trial run, all the previous equipment was brought back into operation and used until this month's actual change-over.

You can get an idea of what this meant when you learn some of the details. In the plant are 445 assembly trucks which fit the body contours. These all had to be altered. The 520 conveyor trunnions likewise had to be changed and then changed back. Sixty conveyor roof panel fixtures had to be revised.

Twenty-two major body fixtures which hold sides, roof panels and floor pans before they are welded underwent extensive change. Some 150 spot welding fixtures and four giant welders, each performing as many as 198 separate welds, were converted. These are high points, hundreds of smaller fixtures and tools also had to be changed, and once tried out many were then removed and placed alongside their stations to be returned to service this month.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	593,060*	505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Sept. 20	147,748	135,015
Sept. 27	142,893	113,973
Oct. 4	143,234	112,868
Oct. 11	138,035	120,543
Oct. 18	140,251	120,810
Oct. 25	144,000*	121,215

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Any End to Horsepower Race?

Some automotive engine designers are beginning to think of themselves as Frankensteins and to have misgivings about the horsepower monsters they have created. Some engineers have started to blame sales and advertising departments and top management for the decision to boost horsepowers. Those groups, in turn, say they aim only to give the public what it demands. Many members of the public ask what it's all about.

Stock reason given for greater horsepower is a valid one—better performance. And probably many engineers would like to reduce the top speed at which their vehicles are capable of going if they could gain performance without getting greater speed as a side effect.

Dodge Moves Boldly

Dodge Division of Chrysler Corp. takes two daring chances with its new models, introduced to the public last week. First was in designing the completely new car to cut its size down to gain greater maneuverability. The largest models have 4½ inches cut off the wheelbase and over-all length. This has been accomplished most pronouncedly in the front end of the car, and the close-hugging rear bumper also contributes somewhat to the shortening. The other risk from a corporate standpoint was to reduce the price of many models even though a completely new 140-hp engine is available.

Dodge maintains for identification purposes a grille very much like that on the 1952 car, but aside from that similarity the car is entirely new. The chrome trim outlining the wheel openings is a continental touch. The corporation departs from long-standing tradition to incorporate a one-piece windshield and the new-commonplace integral fenders and notch back design. A measure of distinctiveness comes from the suggestion of a hump at the top of the rear fender. The new engine is similar in principle to the Chrysler and DeSoto V-8s. Four transmission options are available—standard, overdrive, gyro-matic and the new (for Dodge) gyro-torque.

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ight there in the clutch . . .

SHARON* HI-STRENGTH STEELS ADD LIFE TO HARD WORKING AUTOMOBILE CLUTCHES

Those who work with them call them "lamp-shades." Actually they are clutch springs—part of the standard clutch of the modern automobile.

This particular spring is precision built of Sharon Hi-Strength steel to deliver maintenance-free performance for the life of the car. Production line fabrication of these pieces requires steel of consistent uniformity and analysis.

Like so many manufacturers of high quality steel products, the makers of this important part have learned they can rely on Sharon for consistent quality.

*Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.

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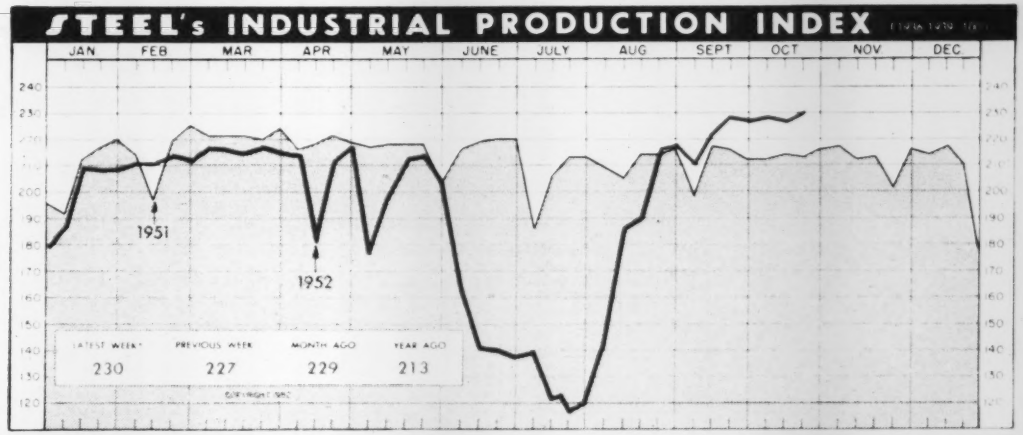
The Business Trend



Industrial activity continues to move sidewise as lower auto-truck production and freight car loadings balance out the steel and electric power increases

PRODUCTION is holding to the high levels reached in September.

Steel producers shoved weekly output from 12 per cent of rated capacity during the strike to 100 per cent by Sept. 6. Since then, the nation's steel turnout has inched up about 1 percentage point a week. Steel production reached 105.5 per cent of rated capacity in the week ended Oct. 18.

Trimmed — Automotive output soared from 22,148 passenger cars and trucks in the first week in August to a 147,748-unit turnout during the week ended Sept. 27. Change-overs and suppliers' strikes have reduced automotive operations since. Nevertheless, more passenger cars and trucks are being turned out each week now than a year ago.

Mirroring the production plateau, STEEL's industrial activity index in the week ended Oct. 18 totaled 230 per cent of the 1936-1939 average. This is only a 1-point rise above the week ended Sept. 27. Significantly, freight car loadings are remaining under the year's peak set in the week ended Sept. 20. Electric power output, on the other hand, is starting to make its seasonal rise, with generation about 7 per cent over the same weeks of last year.

Climb to Come—Watch for a new rise in production during the next few weeks. Automotive output will move upward when passenger car change-overs are completed. Steel production will continue to increase although at a slower pace. And electric power is expected to continue increasing. Freight car loadings now running over 800,000 cars weekly may spurt as the holiday season nears. The coal walkout, however, is having a depressive effect on car loadings.

High-Gear for Autos . . .

Strong production is still the outstanding feature of automotive operations. The industry is keeping passenger car and truck assemblies within the high-for-the-year range, despite model change-overs. Prime reason for this is a sharp increase in overtime and Saturday shifts.

U. S. automakers drove some 103,461 passenger cars off assembly lines during the week ended Oct. 18, says *Ward's Automotive Reports*. This dwarfs the output of 89,685 cars assembled in the comparable period of time last year.

Truck production is rumbling along in high gear. During the week ended Oct. 18, manufacturers turned out 29,502 units, or some 4840 trucks more than in the same week of last year.

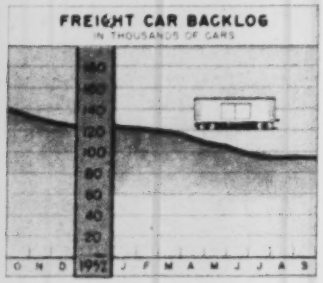
Total U. S. car-truck operations this year look like slim pickings when placed alongside the year-ago turnout. The industry produced 4,228,300 autos and trucks by Oct. 18 of this year. That's more than 1.6 million units less than in the same period of 1951.

Steel Output Rises . . .

Steel production is remaining at record levels. U. S. plants turned out 2,214,000 net tons of steel for ingots and castings last week, the American Iron & Steel Institute estimates. This is only 1000 tons under the record-smashing 2,215,000 tons produced in the week ended Oct. 8.

Construction Activity Booms . . .

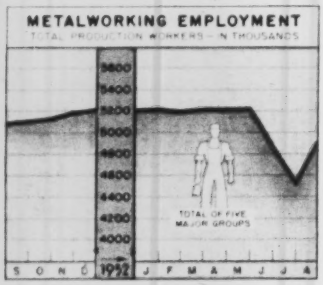
Contractors and builders are having a sizeable business boom. Construction awards in the 37 states east of the Rockies zoomed to $2039 million in September, says F. W. Dodge Corp. This dollar volume is 42 per cent more than that of August and a whopping 88 per



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan.	5,338	26,306	120,203	144,758
Feb.	7,538	15,947	118,900	154,861
Mar.	5,619	11,271	115,804	158,619
Apr.	397	6,628	108,270	155,471
May	2,302	4,919	103,910	150,628
June	1,264	6,798	99,613	147,224
July	1,536	2,417	95,265	144,310
Aug.	4,558	1,824	93,761	139,014
Sept.	1,629	9,867	95,377	140,135
Oct.		3,464		132,792
Nov.		6,272		129,158
Dec.		5,309		123,947
Total		96,190		

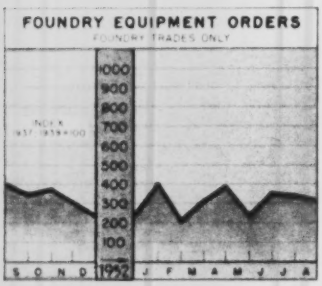
*End of month.
American Railway Car Institute



Metalworking Employment
In Thousands

	Production Workers—Five Major Groups				
1951	Prim. Mfg.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
Jan.	1,155	813	1,220	684	1,187
Feb.	1,165	816	1,231	695	1,197
Sept.	1,159	811	1,219	709	1,210
Oct.	1,160	809	1,242	707	1,260
Nov.	1,151	804	1,255	717	1,242
Dec.	1,155	806	1,270	724	1,238
1952					
Jan.	1,163	804	1,276	723	1,240
Feb.	1,160	805	1,280	726	1,244
Mar.	1,154	807	1,280	722	1,266
Apr.	1,145	806	1,282	714	1,288
May	1,141	798	1,269	708	1,307
June	1,136	788	1,259	705	1,322
July	731	740	1,198	681	1,171
Aug.	1,051	762	1,183	704	1,211

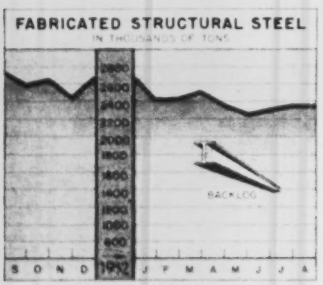
U. S. Bureau of Labor Statistics



Foundry Equipment Orders

	Index		Value Thousands	
	1952	1951	1952	1951
Jan.	404.5	668.0	$1,862	$3,075
Feb.	260.4	638.6	922	2,940
Mar.	310.0	599.0	1,427	2,758
Apr.	353.1	490.1	1,773	2,256
May	225.2	431.7	1,037	1,987
June	343.5	393.2	1,629	1,810
July	311.9	390.3	1,353	1,797
Aug.	311.6	404.5	1,434	1,862
Sept.		346.5		1,595
Oct.		372.4		1,714
Nov.		305.5		1,406
Dec.		230.5		1,061

Foundry Equipment Mfrs. Assn.



Fabricated Structural Steel
Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan.	244.9	214.0	2,416	2,404
Feb.	216.1	193.6	2,405	2,590
Mar.	226.4	237.1	2,501	2,602
Apr.	209.2	234.1	2,356	2,808
May	209.9	234.5	2,293	2,771
June	167.5	227.1	2,261	2,686
July	221.6	204.4	2,361	2,688
Aug.	237.8	236.9	2,363	2,748
Sept.		228.3		2,580
Oct.		239.0		2,641
Nov.		215.2		2,428
Dec.		202.7		2,629
Total		2,665.8		

American Institute of Steel Construction

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Oct. 20	Machine Tools	Oct. 6	Refrigerators	Sept. 29
Durable Goods	Sept. 22	Malleable Castings	Sept. 22	Steel Castings	Sept. 22
Employ., Steel	Oct. 28	Pumps	Oct. 13	Steel Forgings	Oct. 20
Furnaces	Sept. 29	Prices, Consumer	Oct. 20	Steel Shipments	July 28
Gear Sales	Sept. 15	Prices, Wholesale	Oct. 20	Vacuum Cleaners	Oct. 6
Gray Iron Castings	Sept. 22	Radio, TV	Oct. 6	Wages, Metalwkg.	Sept. 8
Index, Production	Sept. 15	Ranges, Elec.	Sept. 29	Washers	Oct. 13
Ironers	Oct. 6	Ranges, Gas	Oct. 13	Water Heaters	Oct. 14

cent greater than construction awards in September, 1951. Nonresidential awards in September were 145 per cent more than in August. Housing awards dropped 19 per cent over the month, but were 8 per cent more than those of September, 1951. Public and private works and utilities dipped 15 per cent below August, but were still 25 per cent above August, 1951. Construction awards in the states east of the Rockies in the first nine months of 1952 rose 2 per cent above the comparable period of 1951.

In the week ended Oct. 16, industrial building continued to boost contract awards for heavy construction to $333 million, about 16 per cent over the average 1952 week, says *Engineering News-Record*. Industrial awards rose 45 per cent over the average week to date to $78.1 million in the week ended Oct. 16.

Retail Sales Jump . . .

Retail sales across the nation are rising far more than seasonally. Department store sales in the week ended Oct. 11 jumped 6 per cent over the comparable week of last year, reports the Federal Reserve Board. The over-the-year increase indicates a substantial dollar volume, considering the year-ago increase was 10 per cent over the same week in 1950.

Despite the retail uptrend in other sections of the nation, New York stores continue to experience a sales drop. Sales by New York department stores fell 7 per cent below the dollar volume of the comparable week in 1951.

TV Shipments Spurt . . .

Shipments of TV sets in August reached 315,332 units, more than twice the shipments in August, 1951, says Radio-Television Manufacturers Association. The sharp increase was caused by the opening of new territories for TV when Federal Trade Commission lifted its ban on new station construction in April.

For the first eight months of 1952, TV shipments were slightly under the same months in 1951. They totaled 2,722,089 units com-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	105.5	104.5	100.5
Electric Power Distributed (million kwhr)	6,681	7,697	7,149
Bituminous Coal Output (daily av.—1000 tons)	1,508	1,496	1,838
Petroleum Production (daily av.—1000 bbl)	6,530[3]	6,517	6,353
Construction Volume (ENR—millions)	$333.3	$341.6	$195.2
Automobile, Truck Output (Ward's—units)	140,251	138,035	120,810
TRADE			
Freight Car Loadings (unit—1000 cars)	850[3]	842	887
Business Failures (Dun & Bradstreet, number)	139	147	157
Currency in Circulation (millions)[4]	$29,617	$29,545	$28,385
Dept. Store Sales (changes from year ago)[3]	+6%	+5%	+10%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$14,938	$17,316	$16,366
Federal Gross Debt (billions)	$264.8	$264.8	$257.0
Bond Volume, NYSE (millions)	$14.2	$15.4	$16.8
Stocks Sales, NYSE (thousands of shares)	5,956	5,438	9,365
Loans and Investments (billions)[5]	$77.3	$75.8	$71.1
United States Gov't. Obligations Held (billions)[4]	$33.0	$31.6	$30.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	217.2	219.0	234.9
All Commodities[7]	110.7	111.1	113.4
All Commodities Other Than Farm and Foods[7]	112.6	112.6	114.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,027,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

pared with 2,744,831 units shipped in the same period, 1951.

Range Shipments Heavy . . .

As sales of household appliances improve, manufacturers of gas stoves find the demand for their products, too, is warming quickly. Industry shipments of domestic gas ranges in September reached 218,600 units, highest monthly total since the 225,000 ranges shipped in April, 1951, says the Gas Appliance Manufacturers Association.

Range shipments in the third quarter totaled 551,800 units. That's more than 17 per cent over the 468,100 ranges shipped in the same period of 1951.

Dividends Drop . . .

Effects of the steel strike—and perhaps an uncertain outlook towards future business—are reflected in the drop in cash dividend payments of metalworking companies.

Dividends by producers of nonferrous metals in September plunged $4.9 million from the year-ago payments to $19.7 million. Payments by the nonelectrical machinery industry dropped $4.6 million from the same 1951 month to $43.1 million. Electrical machinery companies paid out $19.5 million last month, a whopping $7.6-million drop from payments in September, 1951. Cash dividends disbursed by automotive companies dipped only $2.7 million over the year to $120.2 million in September.

Iron and steel companies paid out $77.7 million in September. That's a slight dip of $600,000 from payments made in the same month of last year.

Cash dividends paid by manufacturers, however, rose 3 per cent over the year to $754.9 million. Largest increase occurred among oil refiners.

Trends Fore and Aft . . .

Currency in circulation reached a $29.6 billion peak on Oct. 15. It may soar past $30 billion by Christmas . . . Electric range shipments dipped to 68,620 units in August, but were still well over shipments during August, 1951 . . . Business failures in the week ended Oct. 16 reached 139 casualties, compared with 157 in the comparable week in 1951 . . . Wholesale prices declined in September, after a two-month rise, says the Labor Department . . . Shipments of electric refrigerators dipped slightly to 250,224 units in August.

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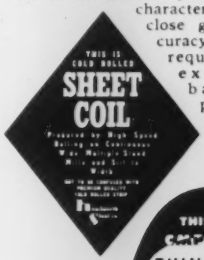
Your costs — and profits — may hinge largely on the cold rolled strip steel you use.

To make certain you get the *right kind*, every coil of cold rolled strip steel we sell is *now* identified by one of these tags.



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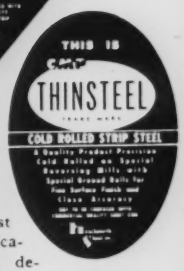

For intricate fabricating operations where die life is an important factor of cost and all applications which demand precision and uniformity of gauge, chemistry and physical properties. Close gauge tolerances insure maximum "square footage" per ton.

Look for the TAG to insure lowest "end cost" on all your strip steel applications. If we can be helpful in selecting the right steel, just call on us.

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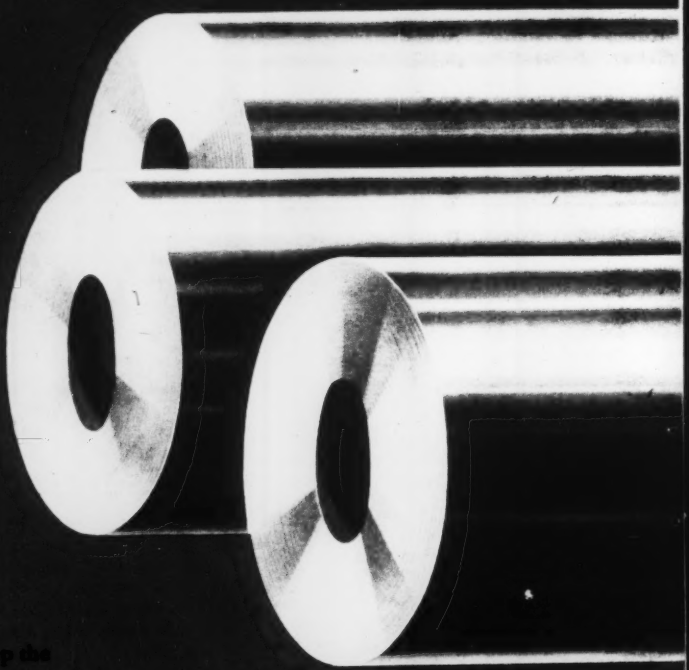


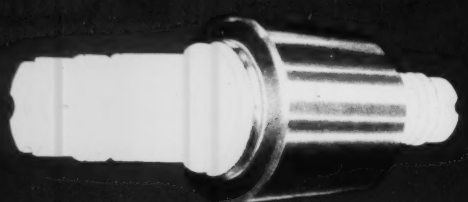
and by the ton

Hoppenstall Back-up roll Sleeves make good production sense

Hoppenstall Sleeves for Back-Up Rolls keep the mill line running longer because they're built to last. They mean less down-time—increased productivity—lower overall costs. Their records of performance make good production sense. They show increases in productivity of from 015% to 120% in terms of roll service, which are typical of the benefits in time and cost savings—increases in production.

And, there's plenty of "reason why" Hoppenstall Sleeves provide this exceptional service. Each sleeve is forged from Hoppenstall's own alloy steel and "custom-built" . . . normalized, annealed, heat treated, and tempered to exact specifications. The result: correct hardness . . . maximum density . . . perfect fit . . . durable surfaces . . . resistance to cracking and spalling in high speed service.

For complete information and technical assistance, call Hoppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.



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Men of Industry

DONALD H. SPICER
. . . a V. P. at American Bosch

MARCUS M. CHAPMAN
. . . new sales position at U. S. Steel

HOWARD E. EARL
. . . joins Sundstrand Machine Tool

Donald H. Spicer was made vice president - manufacturers sales, **American Bosch Corp.**, Springfield, Mass. He was with Firestone Tire & Rubber Co. where he served as president of its World Bestos Corp. Division.

Theodore Skol joined **Abbott Screw & Bolt Co.**, Chicago, as assistant sales manager. He served in a like capacity with Stronghold Screw Products Co. Inc. for the last ten years.

Harry T. Kessler, formerly executive vice president, was elected president and treasurer of **Tuthill Pump Co.**, Chicago, succeeding **G. B. Tuthill**, now chairman of the board. **N. G. Tuthill** was made vice president and secretary.

Transicoil Corp., New York, appointed **Dwight W. Bloser** chief engineer in the manufacture of control motors, induction generators, gear trains and servo amplifiers. He formerly was senior engineer of the motor and synchro lab of Kearfott Co. Inc.

Trent Tube Co., East Troy, Wis., appointed **Frederick E. Wenzel** general manager. He has been works manager since 1949. He also was elected a director of the company.

Marcus M. Chapman was appointed assistant general manager of sales distribution, **United States Steel Co.**, Pittsburgh. He is succeeded as manager of sheet and strip sales by **James P. Barton**, formerly his assistant in that position.

Samuel K. Scovil was appointed assistant manager-ore sales, **Cleveland-Cliffs Iron Co.**, Cleveland. **Robert P. Probeck** was made manager-tax department. **Fred Gregory**, fleet engineer and **James H. Durkin**, consulting marine engineer.

Neil L. Anderson was appointed manager of the steelstrap department of **Acme Steel Products Division**, Acme Steel Co., Chicago. Since 1950 he has been Cincinnati district sales manager.

Francis P. Croak, subcontract manager of the Buffalo division of Houdaille-Hershey Corp., resigned to join **Howard Industries Inc.**, Buffalo, as executive vice president.

A. Donald Kelso, executive vice president and director of **Norton Behr-Manning Overseas Inc.**, Worcester, Mass., was elected president succeeding **Herbert A. Stanton**, retired.

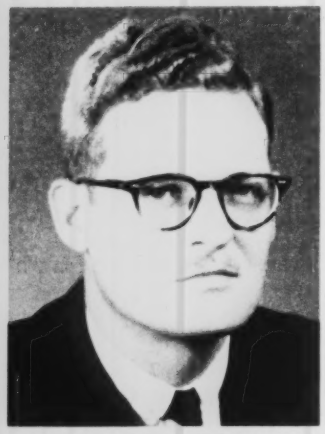
Howard E. Earl joined **Sundstrand Machine Tool Co.**, Rockford, Ill., as chief engineer in charge of the department for development of pneumatic and magnetic products. He formerly was with Eureka Williams Corp. as director of research. Appointments in Sundstrand's machine tool division include **George Seeburg** as assistant general manager, **T. B. Buell** as general sales manager in charge of over-all sales policies, and **Harry Leber**, appointed sales manager.

R. H. Fitzsimmons was appointed district sales manager for northern Ohio by **McInnes Steel Co.**, Corry, Pa., manufacturer of aircraft and alloy steel forgings. For the last 15 years he has been with Jones & Laughlin Steel Corp. in Cleveland.

Charles W. Baker was appointed western regional manager, Los Angeles, for **Chase Brass & Copper Co.** He is replaced by **Charles A. Festge** as Milwaukee district manager. Mr. Festge will also be in charge of Chase warehouse operations at Milwaukee.

William J. Taylor was appointed president, **Exothermic Alloys Sales & Service Inc.**, Bridgeville, Pa. **William F. Skeer** was appointed vice president and **Gordon B. Thomson**,

EDWIN D. SCOTT
joins American Forging & Socket



J. W. BROOMHEAD
Continental Can plant mgr.

RAY H. TIMMONS
mgr. at Westinghouse steam div.

secretary-treasurer. **Jess C. Kerr** was elected a director.

Edwin D. Scott joined **American Forging & Socket Co.**, Pontiac, Mich., to head the research and development staff. Long associated with the automotive industry, he served as chief body engineer at Ford Motor Co. for many years.

Alfred E. Grazen was made assistant general manager of the Buffalo Division, **Houdaille-Hershey Corp.**, Buffalo. He is succeeded as factory manager by **Daniel J. Kennedy**.

Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O., appointed **Alex Oleair** field engineer in charge of a new office opened in Norfolk, Va.

J. W. Broomhead was appointed plant manager of **Continental Can Co.'s** Pittsburgh metal container plant, eastern metal division. He has been manager of industrial engineering, eastern metal division.

At **Joseph T. Ryerson & Son Inc.**, Chicago, **James M. Mead** was appointed first assistant to the vice president in charge of purchasing, procurement and merchandising. He is succeeded as manager of the New York plant by **William O. Springer**, former Cleveland plant manager.

George F. Henschel was appointed manager of sales for the Atlantic division of **American Can Co.** He succeeds **B. R. Wood**, named assistant general manager of Canco's general purchasing department, New York.

Ray H. Timmons is in charge of **Westinghouse Electric Corp.'s** steam division at South Philadelphia, Pa. For the last several years he has been manufacturing manager for the industrial products divisions, Pittsburgh, and prior to that was manager of manufacturing for the transportation and generator division at East Pittsburgh.

Lawrence H. Reecamper and **James A. Cole** were appointed forging engineering specialists for **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. Mr. Reecamper will be located at Kaiser Aluminum sales office at Baltimore and Mr. Cole at the sales office at Los Angeles. **A. Ford Lovelace** was promoted to assistant district manager of the Washington sales office to succeed **Richard H. Gannon**, promoted to Los Angeles district manager.

New members of the board of directors of **Rem-Cru Titanium Inc.**, Midland, Pa., are **Walter H. Wiewel**, vice president-sales, Crucible Steel Co. of America, and **Rowland H. Coleman**, vice president and director of sales, Remington Arms Co.

Howard W. Schuler was elected a director and secretary of **Stolper Steel Products Corp.**, Menomonee Falls, Wis. He succeeds the late **Benjamin Poss** on the board.

Landon C. Fuqua was appointed a sales representative assigned to the Chicago office by **Standard Pressed Steel Co.**

John E. Jackson, president, Pittsburgh-Des Moines Steel Co., Pittsburgh, was elected president of **American Institute of Steel Construction Inc.**, New York, to succeed **R. D. Wood** who is chairman of Mississippi Valley Structural Steel Co.

Loren G. Barnes, formerly division sales manager, Universal Gear Corp., is now **Fageol Heat Machine Co.'s** district sales manager for Illinois, Wisconsin and Minnesota. His headquarters are in Chicago.

Max H. Howarth was appointed manager of **Western Electric Co.'s** Tonawanda, N. Y., plant succeeding **Carl H. Hanson**, transferred to the company's shops at Haverhill, Mass.

Alan B. Castator was appointed general sales manager for **Pittsburgh Plate Glass Co.'s** brush division factories at Baltimore and Keene, N. H.

Blackhawk Mfg. Co., Milwaukee, appointed **William H. McGill** as field representative for its hydraulic control division.

John L. Myers was appointed products engineering manager in charge of design, manufacture and inspection of **National Electric Products Corp.**, Pittsburgh, products. He was in charge of development engineering, television and

"Our railroad bridge is an EYE OPENER for anybody with an assembly problem"

"Whether you're assembling toasters or bridges," Ken went on, *"it pays to set your sights on fasteners."*

"Fasteners?" asked Jack.

"Right!" affirmed Ken. *"We've saved plenty by taking the RB&W man's advice to switch from rivets to high strength RB&W bolts in assembling high stressed structural joints.*

"These bolts stay tight and that saves us maintenance. They assemble faster, and that saves us labor and construction time."

There's a cost-cutting lesson for you in this story, whatever your industry.* So look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New inventions, like RB&W's SPIN-LOCK Screw, may prove more efficient than the fasteners you're now using.** Or you may save by the stepped-up production you get from using the finest fasteners... RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

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**New SPIN-LOCK Catalog is in the Product Design File. Write for extra copies.

JOSEPH S. IMIRIE
assists Carborundum president

ELMER W. KRUEGER
V. P. of Pneumatic Tool

A. N. ABELSON
Aro Equipment V. P.-mfg.

radio department, electronics division.

Joseph S. Imirie was named to the newly created position of assistant to the president of **Carborundum Co.**, Niagara, N. Y. For many years in government service, he has been serving as deputy under secretary of the Air Force. He joined Carborundum last January.

E. W. Petersen was appointed general sales manager, **American Blower Corp.**, Detroit. He joined the company in 1923. He became merchandise manager for the packaged products of the heating and ventilating divisions in 1932 and was made assistant general sales manager in 1951. His new duties cover all divisions of the corporation.

Cleveland Pneumatic Tool Co., Cleveland, appointed **Elmer W. Krueger** vice president. He has been operations manager since 1949, and was elected to the board of directors in 1950.

E. E. Valy was appointed distributor sales manager for **Illinois Tool Works'** new Illinite standard cutting tools. He will be located at Chicago.

W. L. Newhall was appointed director of the department of research and development for **Dravo Corp.**, Pittsburgh, and subsidiaries. Named as assistant directors are **C. R. Horton Jr.** and **A. J. Liebman.** Mr. Newhall previously was assistant general manager of the engineering works division.

A. N. Abelson was elected vice president in charge of manufacturing, **Aro Equipment Corp.**, Bryan, O. Formerly general manager of the Cleveland plant, he now is responsible for production at both Bryan and Cleveland.

W. H. Haugh is purchasing agent, **Chance Vought Aircraft Division,** Dallas, United Aircraft Corp.

Pastushin Aviation Corp., Los Angeles, appointed **Harold Helbock** production manager and **R. E. Vanaman** personnel manager.

Frank L. Dempsey Jr. was appointed sales manager of Detroit Harvester Co.'s newly acquired subsidiary, **Henry & Allen Corp.**, Auburn, N. Y.

OBITUARIES...

Benjamin F. Harris, 66, until 1945 president of U. S. Steel Corp.'s National Tube Co., Oil Well Supply Co. and Tubular Alloy Steel Corp., died Oct. 16 in Pittsburgh.

Fred H. Haggerson, 68, chairman of the board of **Union Carbide & Carbon Corp.**, New York, died Oct. 14. Formerly president of the corporation, he was elected chairman in 1951.

Philip W. Carow, 65, production engineer for 25 years for **Chicago Pneumatic Tool Co.**, New York, died Oct. 13.

Ernest J. Kelly, 61, who retired in 1951 as works engineer at **AC Spark Plug Division**, Flint, Mich., General Motors Corp., died recently.

John E. Ludwig, 57, president and one of the founders of **David-Ludwig Sheet Metal Co.**, Detroit, died Oct. 9.

Karl N. Gougeon, 58, sales manager, MoPar Division, **Chrysler Corp.**, Detroit, died Oct. 8.

Walter Hildorf, 68, former director of metallurgy at **Timken Roller Bearing Co.**, Canton, O., died in Lansing, Mich., Oct. 3.

William G. Ireland, 55, assistant to the president and formerly vice president and general manager of **Bundy Tubing Co.**, Detroit, died Oct. 12.

Alfred A. Conway, 57, president, **Conway Clutch Co.**, Cincinnati, died Oct. 11.

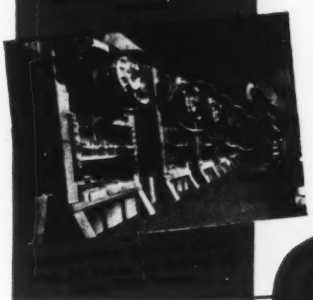
Leo Kulka, 55, assistant chief body engineer of **Chrysler Corp.**, Detroit, died of a heart attack Oct. 14.

John J. Findlater, 69, president, **Ajax Steel & Forge Co.**, Detroit, died Oct. 15.

James E. Loshbough, 81 a founder of **Federal Press Co.**, Elkhart, Ind., died Oct. 10. He served as president of Federal until retirement in 1951.

View of Quick-As-Wink Hydraulic Valve Installation in Steel Mill

Quick-As-Wink Control Valves



smooth month-after-month performance

minimizes your down-time

● Gambling with breakdowns, lost production and plant tie-ups just doesn't pay. Play safe! Install Quick-As-Wink Valves on *all* your air and hydraulic controls. Positive and fast acting, all operating parts of Quick-As-Wink Valves are in pressure balance, eliminating any tendency to creep or crawl. Quick-As-Wink Valves can be serviced easily and quickly, during normal maintenance periods, usually without disturbing connecting piping. There is no metal to metal seating. All parts are standardized and readily interchangeable, avoiding the delay of returning valves to the factory for servicing, and the expense of maintaining large standby inventories. Standardize on Quick-As-Wink — and get *all* the advantages that *only* Quick-As-Wink Valves can give you.

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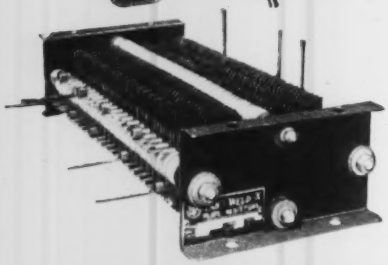
NEW RESISTORS

for Small H.P. Controllers

WELDED Design Gives Many Advantages

Note top and bottom rows of grids with taps welded in place at the end of each grid. No intermediate taps on active material.



Standard mill section, 26½" long—also available in 18" and 12½" lengths.

Spot-welded to insure continuous current-path.

NOW, a standardized line of Welded Plate Resistors by EC&M for small HP controllers—below the range of the well known and popular TAB-WELD Sections for large motor applications.

These new TAB-WELD-X Plate Resistors have all the advantages of the larger sections: corrosion-resistant material—practically constant resistance-values between cold and working temperatures—clamp terminals—internal clamping-nuts maintain uniform overall dimensions—grids joined by welding—terminal-plates welded at the end of each grid for easy adjustment of resistance-value and providing strong supports for external connections.

Other inherent advantages are: no intermediate taps on active material—external leads along either side—lead-insulation not subject to resistor-heat—liberal spacing between grids (¾") gives high heat radiation.

New Bulletin 942-B illustrates, describes and gives ratings of these new EC&M TAB-WELD-X Plate Resistors.

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THE ELECTRIC CONTROLLER & MFG. CO.

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Production and Engineering NEWS AT A GLANCE

MORE, NEW AND FEWER—More power, a new fuel and the use of lesser amounts of critical metals figured in the newest J 40 turbojet aircraft engine Westinghouse is building for the Navy. Substantial amounts of columbium and cobalt were eliminated in the engine which develops thrust equivalent to approximately 25,000 horsepower at today's jet flight speeds. In the newer versions of the engine, Westinghouse expects to make even greater savings of these and other scarce materials. During its qualification test the engine used a new low-cost fuel, especially developed for high-flying jets. Tremendous power is developed through an afterburner that reheats exhaust gases after they leave the turbine but before they emerge as a jet stream.

HOT RADIOGRAPHY—In your welding operations, you no longer have to wait until the metal cools to make a radiographic inspection. A technique called hot radiography, also known as the McElroy-McNutt process steps up welding procedures by reducing by about 55 per cent the total time required to make inspections. The method is as accurate as the conventional one. Its advantages are most striking when it is applied to alloys that otherwise would require a cycle of postheating, controlled cooling and preheat for each radiographic inspection. p. 72

NEW EXTRUSION PROCESS—An improved foreign extrusion process may soon cause quite a stir in this country. To be made available shortly through licensing arrangements, it's a method of making steel nuts, cylinders, shell cases and hollow as well as solid spindles by cold extruding them from steel slugs and blanks—one that eliminates most of the machining as well as a great deal of the scrap resulting from techniques now in use. Ambrif Corp. of Stamford, Conn., American representative for the overseas concern that perfected the process, says an agent of the foreign company will be in the U. S. late in November to deal with American negotiations.

"SHOT" DROPS IRON COSTS—Foundries, especially those in regions where high sulphur coke or scrap are plentiful, and the cost of low-sulphur supplies is high, can make real savings in producing iron by injecting a shot of calcium carbide in the cupola. Companies in the nodular iron field also can cut costs by using higher sulphur pig iron, more steel scrap and less coke. Linde Air Products says higher sulphur content materials may be used since calcium carbide is a strong reducing agent and provides extremely effective sulphur removal within the cupola. Besides providing highly efficient desulphurization, and increasing carbon pickup, increases of 100° F or more in temperature of metal are experienced. With hotter metal, casting is improved.

ONE-WAY PRODUCTION—No backtracking, no temporary supply banks or other bottlenecks clutter up Monarch Machine Tool's new production line. Machine tools previously grouped by type and function are relocated throughout the manufacturing area, augmented by new machines and efficient materials handling aids. By assigning machine tools in areas required, production is strictly a one-way affair. Raw materials, castings, forgings and bar stock, enter the building from the south, progress through various production areas and emerge from the north end of the plant as finished lathes. p. 74

ALUMINUM DEMAND TO GROW—Look for more aluminum to be used in automobiles. In light of new engineering developments and techniques greater tonnages of the metal are predicted for automotive use for such items as torque converters, clutch housings, timing gears, pistons, carburetors, manifold valve covers, body trim and brakes. Acceptance of aluminum pistons by two more auto makers now puts aluminum pistons into all cars on the market today. J. H. Dunn, Alcoa's assistant manager of the Cleveland development division, says intensive development work is going on right now on aluminum radiators, cylinder heads and blocks. Reduction of costs reflected by these developments will shoot the demand for aluminum upward.

DIE-BLOCKS: PRESS PROBLEM—Completion of the 17 heavy presses—eight extrusions and nine forges—ranging from 8000 to 50,000 tons capacity under the direction of the Air Force may present a nice little die-block problem. It takes about six months to complete a set of airplane dies for present equipment. In addition, existing die-block capacity is estimated to be 40,000 to 50,000 tons annually, and the majority of this is capable of producing only the smaller size blocks. Representatives of the forging industry and Air Force jointly estimate that when the heavy press program is operating at efficient level annual die requirement alone may well run from 50,000 to 75,000 tons, averaging in excess of 20 tons each.

METALWORKINGS—Man-effort drops along with capital investment when using compressed air as a production tool (p. 76) . . . Are metallurgical problems bothering you? Many new developments in many phases of metallurgy were discussed at the Metal Show (p. 78) . . . Analyzing minute amounts of elements in very thin sections is an easy task when using a new nondestructive technique (p. 92). Trick is turned by a standard x-ray spectrograph using a special analyzing crystal with newly developed optics . . . Steelmaking technology is due for a big boost in the next few years (p. 94). Not only will it develop simplified and improved methods for mass producing steel, but real fundamental changes are in the wind.

Metalworking Outlook—p. 35 *Market Outlook—p. 121*

Hot Radiography

CUTS WELD INSPECTION TIME

Taking weld radiographs without having to cool the metal can cut former time requirements in less than half. Accuracy is equal to that of conventional method

By ALEXANDER GOBUS
Metallurgist
Sam Tour & Co. Inc.
New York

INSPECTING welds in certain alloys using ordinary radiography techniques involves considerable waste of time and labor. An interesting new process appears to bypass this objection, yet furnish equivalent analysis.

Radiographic inspection for flaws at progressive stages in the weld often saves removing an entire joint weld. However, the objection to the conventional procedure has been that the inspection in itself takes on the proportions of a major undertaking.

Poses Problem — Difficulty is caused by time-consuming methods of radiographing a weld as hot as 600 F with industrial x-ray film vulnerable to temperatures higher than 100 F. Thus, normally, the metal must be cooled before taking the radiograph.

A long process of postheating to relieve internal stresses is required before the controlled cooling begins. After radiographing the cool weld, many more hours of preheating are necessary before welding can be resumed.

Big Step Saved — Hot radiographic technique, the McElroy-McNutt process, makes it possible to take weld radiographs without first having to cool the metal. The advantages of the method, licensed exclusively to Sam Tour & Co. Inc., New York, are most striking when it is applied to alloys that otherwise would require a cycle of postheat, controlled cooling and preheat for each radiographic inspection. For example, hot radiography reduces by about 55 per cent the total time required to weld pipe joints in high-temperature steam lines.

Device protecting the film against high temperatures for pipe-welding is the water-cooled jacket illustrated. It consists of two hollow cylinder sections hinged at one end and fitted with wing-nut fasteners at the other. Piping connections provide inlet and outlet for the cooling fluid and a rubber hose allows the fluid to circulate smoothly through both hollow members.

Hollow, raised sides of the jacket help maintain an even temperature distribution along the surface that comes into contact with the film cassette. Flexible cassettes containing film fit snugly between the raised jacket edges and are held in place with heavy rubber retaining bands.

Setting Up—When a radiograph is to be taken of a hot pipe weld, the jacket is placed between the induction heating coils and clamped around the pipe. After water has circulated several minutes, three cassettes, covering the circumference of the pipe, are fastened in place. Gamma radiation from a source held at the center of the pipe penetrates the weld and forms an image of its structure on the film. The whole operation is conducted at preheat temperature and welding need be interrupted for only about 30 minutes depending on the thickness of the weld and exposure needed.

Radioactive material is held at the center of the pipe by a special jig. Arm of the jig fits through an opening near the weld. When the joint is completed, a plug of the same alloy as the pipe is screwed into the opening and welded to the outer pipe surface. Other methods of introducing the gamma-ray are used when the weld is near a pipe end, but the jig arrangement allows accurate positioning of the source.

Meets Standards — Use of the cooling jacket increases the distance between source and film (by about $\frac{1}{2}$-inch), introduces two thin sections of steel before the film and it adds a layer of water that must be penetrated by the radiation. These factors have no observable effect on the radiographs and are permitted by code regulations. Penetrameter sensitivity with the new method is at least 2 per cent. This accuracy is equal to that of the conventional method and is easily within the requirements of the ASME Power Boiler Code.

Comparison of the hot radiography process with ordinary technique is provided by numerous applications of both methods to pipe welding in power plants. In one of the modern plants where hot radiography was employed, the pip-

COMPARISON OF INSPECTION TECHNIQUES

Conventional Radiography Welding Operation	Hours	Hot Radiography Welding Operation	Hours
A. Preheat	3	A. Preheat	3
B. Weld first ¾ in. (5 passes)	9	B. Weld first ¾ in. (5 passes)	9
C. Post heat and cool for radiograph	32		
D. Radiograph and develop	3	C. Hot radiograph	½
E. Preheat	3		
F. Weld to 1¾ in. (14 passes)	10½	D. Weld to 1¾ in. (14 passes)	10½
G. Post heat and cool for radiograph	32		
H. Radiograph and develop film	3½	E. Hot radiography	1
I. Preheat	3		
J. Finish welding	27½	F. Finish welding	27½
K. Post heat and cool	32	G. Grind overlay	3
L. Grind overlay	3	H. Final hot radiography	1
M. Final radiograph and develop	3½	I. Post heat	15
Total	165		70½

ing was designed to carry steam at 1050 F and 1500 psi.

To withstand the high temperature and pressure, the pipe is made of steel alloyed with $2\frac{1}{4}$ per cent chromium and 1 per cent molybdenum. The alloy pipe, requiring close dimensional tolerance and careful inspection, is 3 inches thick with outer diameter of 17 inches. Preheat temperature maintained by induction heating coils is 600 F, temperature for stress relieving is 1300 F. Pipe is sensitive to fabrication methods, especially thermal shock due to temperature change.

Breakdown of time spent on each radiographic method is given in the accompanying table. For this typical pipe joint, hot radiography cut welding time by 94.5 hours.

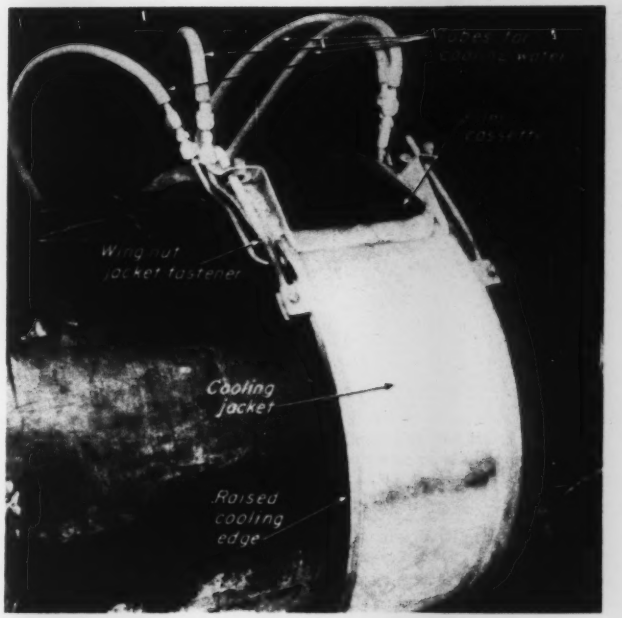
Much Time Lost—By the ordinary method of cooling the weld before radiography, the stress relieving cycle consumes at least 32 hours for each radiograph. In spite of the time loss, it is considered necessary to make at least one intermediate inspection to avoid chipping out a complete weld when, for example, a flaw might be near the root.

Using the new method, the first intermediate inspection was made after completing $\frac{3}{4}$-inch of the weld. Early inspection of the weld base is advisable because flaws are most likely to occur at the root of the weld. Cooling jacket was clamped into position as soon as welding stopped.

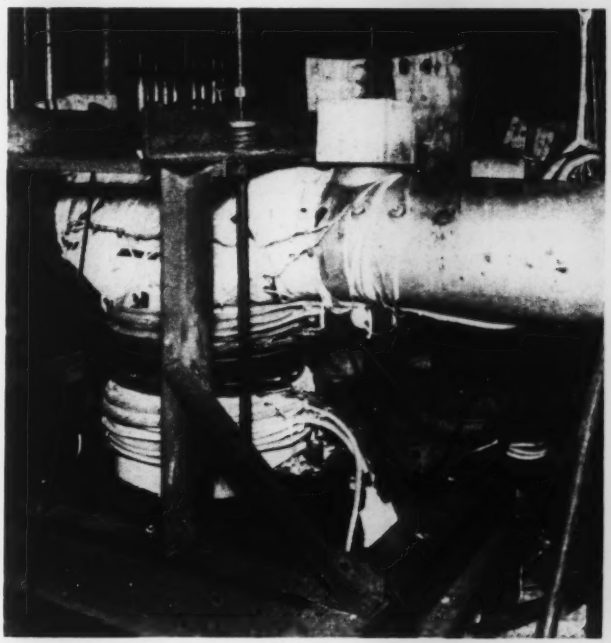
Quick Exposure — After water had circulated for a few minutes, the cassettes were fastened into place and the film exposed. Welding was continued as soon as the exposure was completed.

Radiographs were taken and analyzed after completing each inch of weld so that a minimum of metal would have to be removed in case flaws were discovered. If flaws occur, the joint is kept at the preheat temperature during chipping to eliminate taking the pipe through a temperature cycle to remove a defective weld.

Process is used with similar time saving results on welding jobs other than pipe. If the surface to be radiographed is not cylindrical, special cooling fixtures can be designed.



Hot radiography cooling jacket is clamped around pipe by wing nut fasteners. Water circulating through hollow sections protects the film from high temperatures



Film cassettes are held in place with rubber fasteners. On this job hot radiography interrupted welding from 30 minutes to an hour depending on the weld thickness

Small crane car unloads smaller size castings. Beds and other large castings are unloaded by tramrail crane. Buggies and platform trucks take them inside

NEW PLANT LAYOUT STREAMLINES

MANUFACTURERS whose operations aren't figured in thousands of units per day can still take advantage of mass production techniques and materials handling economies through good production planning and plant layout. Monarch Machine Tool Co., Sidney, O., provides an excellent example. By taking machines to the work instead of taking work to the machine the company expedites lathe production in its newly expanded plant.

The story lies in the fact Monarch didn't stop with adding 53,000 square feet to its manufacturing area but revitalized materials handling functions, integrated equipment and methods for higher efficiency in existing areas and coordinated new equipment installed throughout both old and new production areas. It was a big job since the plant now totals 308,000 square feet. In this area 80 overhead, gantry and tramrail cranes are brand new.

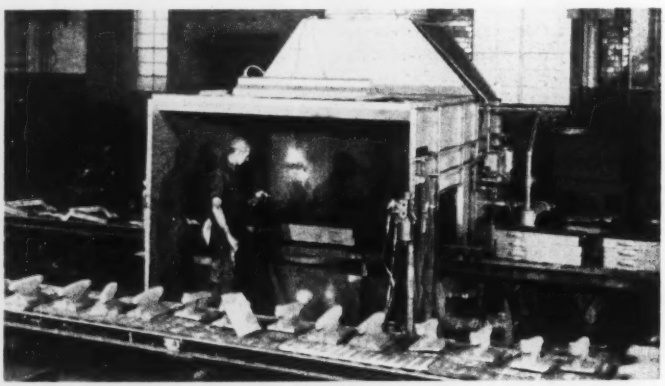
Keeping Modern—Once again a machine tool company proved to be a good customer for the entire industry. Of the 350 machines in the entire plant 77 are new and include all types and sizes.

In the new layout a quality control center is located within the immediate vicinity of departments that will use it. The center includes: Chemistry laboratory, metallurgical room, gear control area, facilities for experimental heat treating and a dark room. Grouped around this completely enclosed space are the plating and finishing, heat treating and gear departments. The heat treating department adjoins the gear, and shaft and spindle departments, both of which make use of heat treating facilities.

Realignment—Machine tools previously grouped by type and function, are relocated throughout the manufacturing area and augmented by new machines. Production of a lathe is no longer thought of in terms of one manufacturing procedure. Instead, many separate manufacturing departments are set up; each with responsibility for machining and inspecting a single major component (such as headstocks, tailstocks, aprons, carriages and beds). Machine tools required for each of the individual manufacturing units are assigned to that unit, and floor area proportioned accordingly.

As the new departmental idea took form, it was apparent that new ideas of production could also be incorporated. The result is installation of basically straight-line production methods.

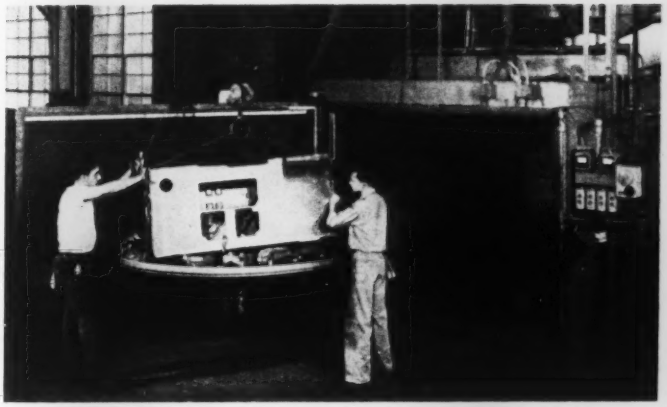
Raw materials—castings, forgings and bar stock—enter the building from the south, progress



Closeup of one of two water-bath paint spray booths served by four conveyor lines. Spray line conveyor is broken by 360-degree turntable in the middle

Evolution of a production plan that brings the machines to the work instead of taking work to machines yields a manufacturing process that is basically straight line

PRODUCTION



Castings brought into plant from outside storage yard are cleaned by a new shot blasting machine of large capacity or if necessary by snagging with hand grinders

through the various production departments and emerge from the north end of the plant as finished lathes. Individually manufactured major components, and the lesser parts and accessories come together in the erection area at the north end of the building where they are assembled, inspected and tested as complete machines.

Far and Wide — Basic to this straight-line flow of materials is a 930-foot middle aisle stretching from one end of the manufacturing area to the other. Overhead cranes serve this 53-foot wide manufacturing bay from one end of the building to the other. Also available for use with these overhead cranes are many smaller gantry cranes. In many instances there is not one but several choices of equipment for any given lift, reducing waiting time and insuring uninterrupted production.

Steady production is one of the greatest benefits accruing from the new layout. Little space is taken up with parts storage between operations. No more than enough extra parts are in progress at any one time to keep operations moving without interruption. Also, since materials flowing through the main production and individual manufacturing areas are always headed in the same direction, much waste motion and lost time are avoided.

Materials handling equipment is overlapped in such a way that it is completely integrated with the production process. For example, wherever a lifting job must be done, inside or outside the plant, there is always at least one mechanical aid at hand to assist.

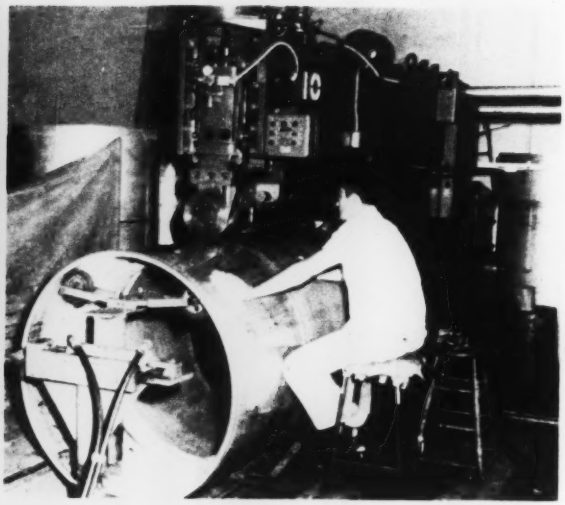
Even Outside — Castings are trucked to the plant from various foundries. A small car crane unloads the medium and small size castings and they are stacked in the casting storage yard at the south end of the plant. Beds and other large castings are unloaded from the trucks by an outside, tramrail crane; then stored within the crane rail support columns. Castings are loaded on four-wheel buggies or platforms by the outside cranes and towed into the plant by tractor as needed.

Small and medium-sized castings are delivered to a large shot blasting machine just inside the plant where they are completely cleaned prior to protective painting. Hand grinders are used to remove casting irregularities. The bed frames are unloaded onto double, tracked dollies by one of the overhead cranes in the main bay. Because they must accommodate several different sizes of beds, these dollies are not interconnected. Beds remain on them during all hand

(*Please turn to Page* 101)

Lathe production is divided into several parts. Each represents a complete operation with single responsibility for a single unit like this headstock

Rotary cutter with plate attached eliminates filing of excess metal stretched over wing section



Air-operated ram at left aligns tank during welding operation. Lever on stool controls alignment apparatus

Compressed Air Steps Up Production

Requiring little capital outlay, compressed air drops man-effort required for the job. It serves as operating power for production tools, is used in testing applications

WITH RECENT, present and future demands for increased production on the part of almost all hands, industry is constantly faced with the darker side of the picture: increased capital investment.

One answer to this situation is compressed air. It's finding new and expanding fields of application in many industries and plants. Using this medium many plants have upped their output considerably with an investment hardly worth mentioning.

Sustained Quality—Compressed Air & Gas Institute, Cleveland, points out there must be virtually no reduction in product quality when quantity is stepped up.

Aircraft plants, as an example, are finding that compressed air can be a production engineer's friend and a factory worker's ally. Production is boosted and at the same time there is usually an accompanying drop in man-effort required to do the job.

Some operations at Ryan Aeronautical Co., San Diego, Calif., illustrate the trend.

Air Weld—A variety of welding operations have been increased by the use of compressed air in one way or another. On circumferential welds of a B-47 wing tank, one worker formerly maintained alignment of the tank to the weld wheels manually.

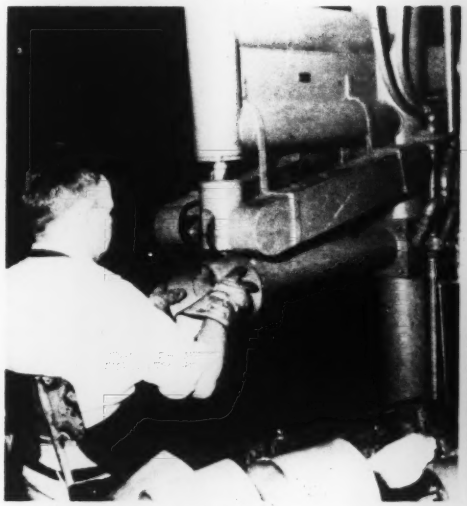
Now the welding machine operator moves the tank either way during welding by touching a lever which controls the action of an air cylinder connected with a fixture at the end of the part. It reduced cost of the work by the amount paid one man.

All at Once—More marked saving is found in connection with joining the outer combustion chamber for a jet engine. There are 12 spot welds in this operation. Three air cylinders, one for every four guns, actuate the guns simultaneously as the part is held in an air-operated fixture. An air-operated mandrel adjusts for size before the welding operation.

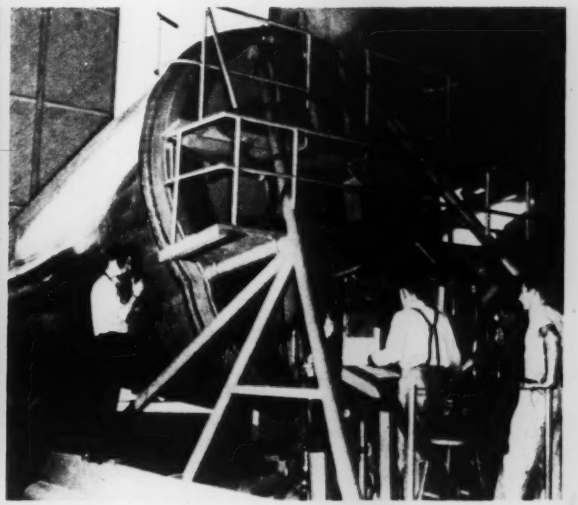
Formerly one spot weld was made at a time as the part was held by hand. Production is not only 12 times faster now, but scrap loss also has been cut by 40 per cent because there are fewer unmatched asemblies.

Seam Roller—Compressed air is improving welding operations on cylindrical shaped parts. An air-operated seam weld roller replaced grinding. With an air cylinder acting on the roller, the weld bead is reduced to the same thickness as sheet material and grain structure of the weld is refined. Formerly these precision parts with a tolerance of 0.0001-inch, plus or minus, were brought to standard by grinding the bead. Roller method is not only ten times faster, but has cut scrap loss in half.

Ryan also has built a tacking press for bringing two manifold



An air-operated roller flattens the weld metal. This operation replaces the weld-grinding step



Strato-freighter fuselage is tested for high altitude flight by introducing air pressure simulated to altitudes

sections together for welding. An air ram forces punch against die for a tight fit during the tacking operation. Before this setup, which includes a bed and two posts to support the ram, the parts were pushed by hand against the spot welder. Mismatching resulted and scrap loss was high.

Portable tools have always been important to the aircraft industry, which so often must take the tool to the work rather than the work to the tool.

Even Trimming—For instance, a rotary cutter was adapted for trimming the small excess of aluminum skin which is stretched from the leading edge to the trailing edge of a wing. Stop-plate assures the metal will be evenly milled as the pneumatic cutter is butted against the stringer. Arrangement was devised to eliminate filing off excess metal and resulted in substantial time saving.

Original cost is a relatively minor consideration in making tool selections. Productivity of the tool in the hands of a worker at certain hourly rates, the maintenance cost and life of the tool are of primary importance because these factors outweigh original cost.

No Spark—Air motors are light which reduces worker fatigue and improves output. Where weight is not an important factor as well as where it is, the advantage of variable speeds obtainable from air motors is important.

Spark-free motors are an important safety factor in many working areas. Low maintenance cost has been experienced with these tools which have motors built with a minimum number of moving parts.

For Inspection—Air-tight testing of tanks and other parts is another common use for compressed air. For instance, a B-36 exhaust manifold is pressure tested by filling with air up to a certain pressure and then lowering the part into a tank of water by an air hoist. Other types of vessels are tested by soaping the seams after filling tank with compressed air.

Resistance weld seams of a B-47 fuel tank are tested this way after placing the tank in a fixture with two rubber pads at either end and tightening one pad against the tank by an air-actuated ram. Entire fuselage sections for the Boeing C-97 Stratofreighter are pressure tested for high altitude flight by introducing compressed air up to a determined pressure.

Compressor Team—The Ryan plant has two main air compressor stations, each having two motor driven compressors of 900 cubic feet per minute capacity each. One unit is used with the second cutting in automatically when line pressure drops to 80 psi.

Use of units at each station is alternated every 30 days. In another section of the plant there is a 200 cubic feet per minute compressor to serve welding machines and in still another section, a 900 cubic feet per minute compressor has been installed.

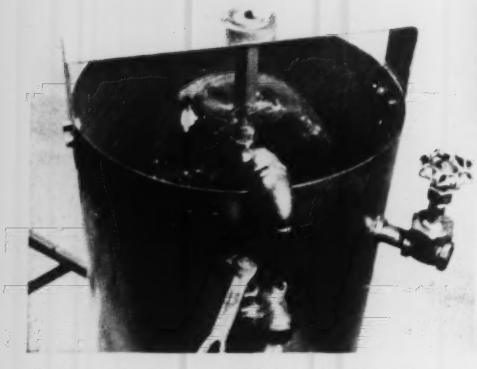
All plant lines are tied in so compressed air can be obtained from any unit when balanced pressure is needed. Clean, dry air is assured by the use of filters, aftercoolers and a regular schedule for draining moisture from traps along the main plant lines. The main lines are of ample diameter to carry the air without causing pressure drop.

Machine Drills Jet Housings

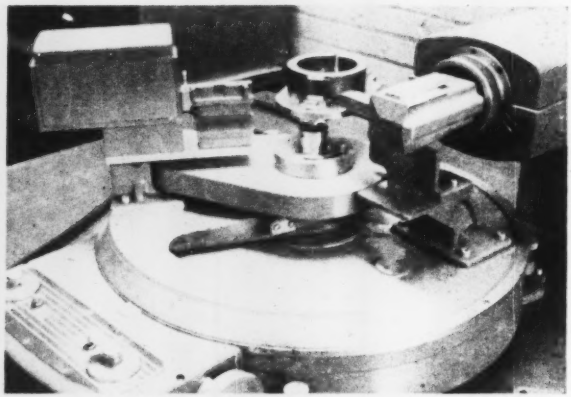
Development of a new five-way drilling machine for jet engine housings is announced by Modern Industrial Engineering Co., Detroit.

The machine features interchangeable multiple drill heads on two of the five stations. This permits production of several housing types having a variety of bolt circle specifications on faces with identical radial locations.

Eight stations and nine operations complete the multiple drilling and tapping of holes in the housing.



End quenching trapezoidal bar developed by General Motors for measuring hardenability of case-treated steels



X-ray Spectrogoniometer that is used for measuring engineering stress in hardened high carbon steel

Advances in Metallurgy Revealed in ASM Sessions

Getting a better understanding of what happens to metals at high temperatures occupies center of the stage at technical sessions in Philadelphia

NEW DEVELOPMENTS in many phases of metallurgy were brought out in papers presented at technical sessions of American Society for Metals featured as a part of the National Metal Congress, Oct. 20-24.

Subjects discussed at the various sessions were divided into the following general groups: 1. Creep-rupture and recrystallization, 2. high-temperature phases, 3. phase transformation, 4. hardenability, 5. research, 6. mechanical properties, 7. temper brittleness. At the opening session on creep-rupture and recrystallization, N. J. Grant and A. G. Bucklin, Massachusetts Institute of Technology, gave conclusions drawn from extensive creep rupture tests on wrought Monel, at temperatures from 700 to 1700° F and involving stresses of as high as 90,000 psi from 0.001 to 2700 hours.

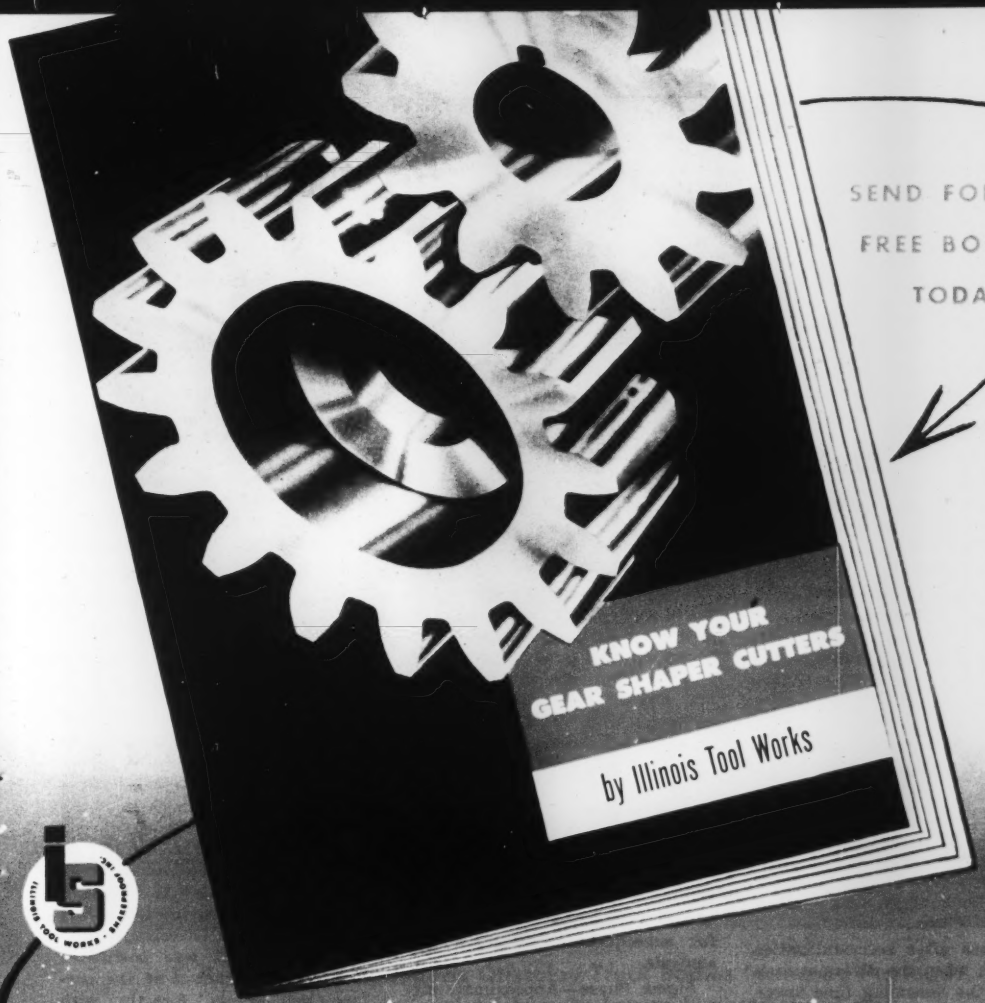
Recrystallization occurs during creep rupture testing of Monel and is effective in lowering creep resistance and rupture life through forming a very fine grain size along the grain boundaries. Thirty per cent cold work effectively improves the creep rupture strength of Monel up to 900° F, for a period of about 2000 hours. At temperatures above 1100° F, no benefit at all is evident.

Tests showed that instabilities which increase the long time creep and rupture properties of Monel are the incidence of intercrystalline fracture, oxidation and recrystallization. Time-temperature relationships for recrystallization, as measured by hardness changes, do not serve as accurate indications of the onset of intercrystalline cracks in creep rupture testing of the material. Co-incidentally, evidence of recrystallization is present at much lower temperatures and shorter times in creep rupture tests than could be predicted from static recrystallization studies. These tests were made on annealed 30 per cent cold worked and 75 per cent cold worked structures.

More on Monel—Evidence that coarse-grained Monel is more creep-resistant than fine-grained Monel at high temperatures, while the reverse is true at low temperatures, has resulted from work conducted by Paul Shahinian and Joseph R. Lane, Naval Research Laboratory. In describing experimentation with various grain sizes of the nickel-copper alloy, it was pointed out that grain diameters of metals in the experiments were measured at from 0.779 mm to 0.0240 mm.

Treatments to achieve variance in grain size included vacuum annealing from 1300° F to 2300° F, for periods from 2 to 24 hours, accompanied in some cases by cold rolling.

Shahinian and Lane pointed out that there may or may not be an optimum grain size for the lowest minimum creep rate, depending on temperature and stress. At 900° F and 1100° F there is an optimum grain size, but at 1300° F the min-



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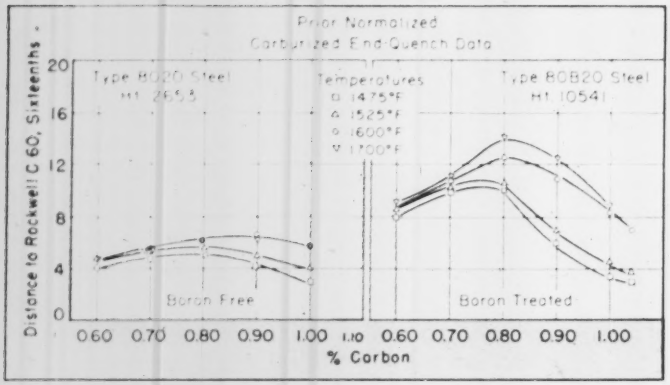


Case hardenability of boron free and treated steels carburized and reheated to four hardening temperatures

imum creep rate decreases with increase in grain size.

Rolling Cartridge Brass—The results of experiments on cold-rolling commercially pure 70-30 cartridge brass to effect recrystallization were given by S. L. Channon, Kaiser Aluminum & Metals Corp. and H. L. Walker, University of Illinois.

The experiments showed that the annealing time for complete recrystallization is shorter, when the following conditions are met: 1. Higher deformation, 2. higher annealing temperature, and 3. small initial grain size.

Hardness after recrystallization is higher, when the deformation is greater, the annealing time lower, and the initial grain size is fine.

Several other important points were brought out in the rolling studies. The recrystallized grain size was found to be independent of the annealing temperature. The finer the recrystallized grain size, the more rapid is grain growth in the early stages of annealing. The rate of grain growth at 600 C appears to decrease and then increase after further annealing for longer periods.

High-Temperature Phases

The afternoon session of the opening day's technical program featured a discussion of high-temperature phases.

Opening this session, H. J. Beatty Jr. and F. L. VerSnyder, Thomson Laboratory, General Electric Co., reported that complementary use of x-ray diffraction with microstructural study of electrolytically separated high temperature alloys, based respectively on iron, cobalt and nickel, showed that all have a face-centered cubic lattice, with nearly equal atomic radii.

Specimens were studied microscopically to determine the number of microconstituents present. They were then electrolytically digested to separate microconstitutents from the matrix as an insoluble residue. Drying of the residue resulted in a powder that is suitable for subsequent x-ray diffraction analysis.

Sigma Phase—Approximate sigma phase boundaries over the temperature range 1200 to 1650 F have been located by metallographic means for iron-nickel-chromium alloys of relatively high alloy content, according to a report by A. M. Talbot and D. E. Furman, International Nickel Co.

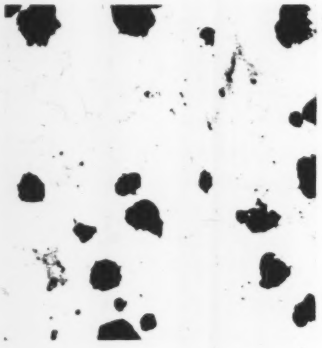
For conditions approaching equilibrium, the limiting sigma boundary was found to extend from about 21 per cent chromium at 20 per cent nickel to 24 per cent chromium at 35 per cent nickel. Heat treatments conducted in the experiments, which used specimens of simulated commercial quality, ranged from 100 to 3000 hours.

It was found that the sigma area extends to low chromium levels in the case of cold worked materials, whereas, relatively more stable cast structures appeared to have sigma boundary located at higher chromium content.

Impact tests at room temperature showed that 5 per cent sigma caused serious embrittlement. Embrittlement increased rapidly with the first few per cent of sigma formed regardless of the base composition. An increase of silicon moved the sigma boundry to about 19 per cent chromium with 25 or 35 per cent nickel.

Sigma vs Austenite—Two British researchers, T. P. Hoar, University of Cambridge, and K. W. J. Bowen, Imperial Chemical Industries, reported that austenite and sigma were extracted from 18-8-3-1 chromium - nickel - molybdenum - titanium steel, heat treated for various periods at 1562 F, by selective anodic dissolution in 25 per cent sulphuric and in 50 per cent hydrochloric acid. The extracted sigma is ferromagnetic at low temperatures. It is much higher in chromium and molybdenum, higher in titanium, and much lower in nickel, iron and manganese than the corresponding austenite.

Stainless Carburization—Austenitic, chromium-nickel steels of the 18-8 variety can absorb carbon from solid carburizers even though the partial pressure of carbon dioxide and water vapor is held to a low value, according to experiments reported by J. B. Giacobbe, Superior Tube Co. It was postulated that absorbed carbon at the surface may react directly with chromium and molybdenum to form carbides which, under equilibrium



Structure of nodular iron rupture specimen after heating for 830 hours at 1200 F. Picral etch. 100 X

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E. F. Robinson Co. Reports Otiscoloy Truck Bodies Increased Payloads, Gave Longer Service Life with Lower Maintenance Costs

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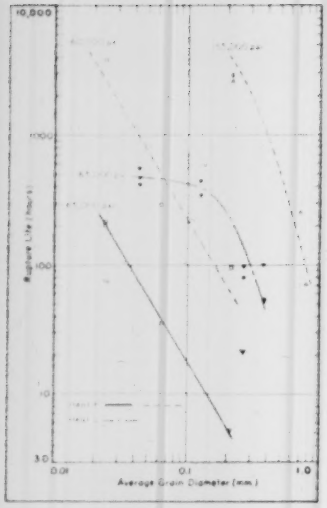

Variation of rupture life with grain size of Monel specimen heated at 700° F

conditions, provide the necessary carbon for entry into the austenite.

In experimentation to arrive at this new theory for carburization, Giacobbe deposited high purity graphite between two flattened sections of tube. A vacuum apparatus then pumped down to a pressure of about 10-4 mm mercury. After six hours under this vacuum to release absorbed surface oxygen, a compression load was applied to the specimens by a universal tensile tester of 20,000 pounds capacity.

This was done primarily to obtain close contact between the metal surface and high purity graphite. The pressure, however, was found to have a pronounced effect on the rate of carburization. After releasing the load and with the vacuum system still pumping, the tube was guided into an atmosphere-controlled muffle furnace operating at a temperature of 1900° F, where the reaction area was held at temperature for 60 minutes. The process forced carburization to depths that ranged from 0.004 to 0.014-inch.

Phase Transformation

The second day of the ASM technical program began with a general session on phase transformation. In the kick-off paper, G. H. Eichelman, American Brass Co. and F. C. Hull, Westinghouse, told the assembled metal technologists that the composition of 18-8 type stainless steels has a definite effect on the temperature at which the martensitic transformation begins.

The two researchers reported that the constitutents, silicon, manganese, chromium, nickel, carbon or nitrogen, permit the start of martensite formation (M_s) to take place at lower temperatures than otherwise. The elements are effective in the order named. To evaluate the effect of each of the six alloying elements in suppressing the austenite to martensite transformation the M_s temperatures of 25 heats of stainless steel of selected composition were determined.

Precipitation of carbides results in an increase in the M_s temperature which varies with the amount of carbon and chromium removed from solid solution. Also, noted was the fact that M_s changes caused by carbide precipitation can be used as a sensitive means for determining the solubility of carbon in stainless steel.

Silicon Affects Tempering—Investigation on tempering 0.6 carbon base and 0.4 carbon, 3 per cent nickel base steels containing up to 2.2 per cent silicon show that the temperature at which cementite forms on heating the martensite at a definite rate, is raised in a definite relation to the atomic per cent of silicon present. This finding was reported by A. G. Allton and P. Payson based on tests conducted in Crucible Steel Co.'s research laboratory.

The temperature at which cementite formed in the 3 per cent nickel base steel has raised about 300° F by an increase of silicon from 0.5 per cent to 2.2 per cent. Epsilon iron carbide was detected on the 0.6 carbon steels after tempers at lower temperatures than those required to produce cementite.

Softening of the 2.2 silicon steels was retarded in the tempering range of 400 to 600° F. Hardness after a given temper in that range was found to depend only on the silicon and carbon contents of the steels.

Tempering Mechanism Explored

A single-crystal x-ray technique has been employed by C. S. Roberts, Dow Chemical Co. and B. L. Averbach and Morris Cohen, Massachusetts Institute of Technology, to ascertain changes in the martensite matrix attending the rejection of carbon. The experimental work discussed at the meeting was based on studies involving a series of high-purity iron-carbon alloys and commercial steels.

First stage of tempering proceeds by the growth of an aggregate, consisting of low-carbon martensite and hexagonal close-packed carbide at expense of the primary martensite. The low carbon martensite is tetragonal, with an axial ratio corresponding to a carbon content of 0.25 per cent, and appears to be in metastable equilibrium with the hexagonal carbide.

It was also reported that incidental elements in plain carbon steel, do not appear to alter the general kinetics and mechanism of the first stage of tempering. However, they do increase the tempering rate.

The transformation rate of retained austenite in the second stage of tempering is controlled by the rate of carbon diffusion in the austenite.

Hardenability

The afternoon session of the second day of the technical meeting was devoted to hardenability. This session was given a good start by the description of a new time-saving end quench bar developed in General Motors Research Laboratories by F. X. Kayser, R. F. Thomson and A. L. Boegehold.

The bar is trapezoid in shape, instead of circular. Two opposite sides are coated with copper to inhibit carburizing. After the two other sides have carburized, it can be used for impact tests directed both horizontally and perpendicularly on the plane surfaces of the carburized section.

Tests along the gradient of the carburized areas, therefore, may be conducted without waste of time in grinding or sawing. To facilitate quenching, the bar is fitted with a screw insert, which serves as a hook.

Boron Steels Too—Tests to evaluate effect of boron on case hardenability of 80B20, 94BV20, and 47B20 over a range of carbon con-

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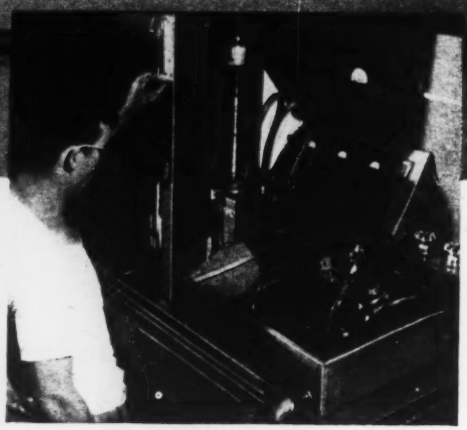

These 25 tractor parts posed quite a problem to International Harvester's new Louisville Works. Each one had to be hardened—quickly, efficiently, economically. Each one could have been a "production headache"!

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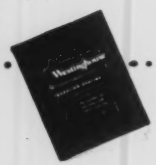

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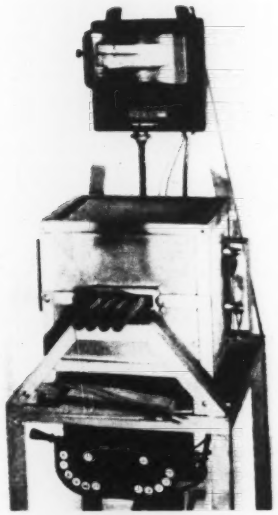


Gradient furnace used for accelerated age hardening and strain line testing. Globars are near end of the furnace

tents between 0.60 per cent and 1.0 per cent for several heat treating conditions, were described by C. F. Jatczak and E. S. Rowland, Timken Roller Bearing Co.

One conclusion drawn from the carburized end-quench tests was that for all heat treatments used, the effect of boron on the case hardenability of all four boron treated steels decreased with increase in carbon content.

In double quench practice, the effect of boron is low to negligible at high carbon levels with a normal hardening temperature in the 1475 to 1525 F range. In general, the boron effect increased with quenching temperature at a given carbon level. Single quench treatments yielded much higher boron effects at the higher carbon levels than double quench treatments at normal hardening temperatures.

In the normal hardening range of 1475 to 1525 F, with double quench practice, a single heat of 91BV20 (treated with Granial No. 1) exhibited negligible boron hardenability effect at all carbon levels investigated. Higher hardening temperatures and single quench treatments yielded as large boron effect as any obtained. It was postulated that this behavior is due to the nucleating effects of undissolved vanadium carbide on austenite transformation at low solution temperatures.

High Speed Steel—In discussing the effect of carbon content on 18-4-1 high speed steel, A. H. Grobe and G. A. Roberts, Vanadium-Alloys Steel Co., pointed out that for hot working dies of maximum hot hardness, 18-4-1 high speed steels with 0.50 to 0.55 per cent carbon have proved popular. Steels with 0.55 to 0.70 per cent carbon are employed for cutting tools requiring high resistance to breakage. This carbon range also is often chosen when high speed steel, because of its high wear resistance and good edge strength, is desired for cold work applications, such as blanking, trimming and forming dies.

The Grobe-Roberts paper pointed to the conclusion that when hardened from the same hardening temperature and compared at the same hardness level, a decrease in carbon content increases impact strength. Lowering of carbon content was described as more effective in obtaining high impact strength than is lowering of the hardening temperature in any one steel.

Machinability vs Inclusions — Characteristics of inclusions in rolled resulphurized steels are governed by silicon and sulphur content, and possibly oxygen content of the sulphide phase, as well as by the mechanical working the steel receives, Lawrence H. Van Vlack, United States Steel Co., told the meeting in the last paper that was given in the hardenability session.

The machinability, in turn, was said to be dependent upon the size or number of inclusions in the steel to a considerable extent when other metallurgical factors are comparable.

Length-width ratios of inclusions were determined with an occular micrometer. Length-width value for each steel sample was obtained by averaging length-width ratios of at least 25 inclusions selected at random across the microsection of the steel.

Van Vlack indicated that these sulphide inclusions which are greater than 0.005 mm in length are believed important for machinability. Thus, only those inclusions 0.005 mm or greater in length were counted in the study.

It was concluded that larger inclusions favor machinability. More inclusions (by high sulphur contents) increase machinability. Glassy oxide inclusions reduce machinability.

Research

Opening the afternoon session of the third day of the ASM meeting, which was devoted to research, Thad Vreeland Jr., D. S. Wood, and D. S. Clark, California Institute of Technology, discussed the results of an investigation made to determine whether or not the cumulative time at stress for a series of stress-pulses is the same as the delay time required for initiation of yielding in a single rapid-loading test.

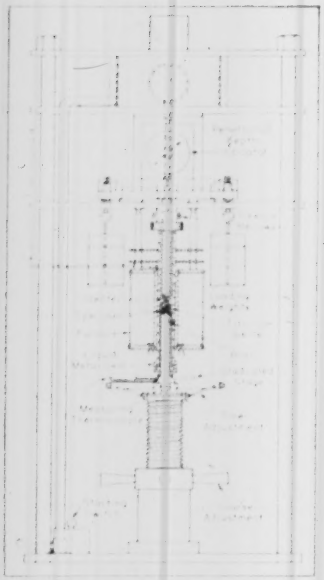
Results showed that a definite recovery from effects of previous stress-pulse took place when the combination of time and temperature between stress-pulse was sufficient.

Oxygen via Isotope—Quantitative determination of the oxygen content of metals utilizing the isotope O^{18} was described as giving accurate results fast, by A. D. Kirshenbaum and A. V. Grosse, Temple University Research Institute. The only requirement of the isotope method is exchange of all oxygen atoms in the system, which is accomplished by the temperature used in the test. The experimenters obtained accurate oxygen values for several copper-oxygen alloys, iron-oxygen alloys and for copper and iron oxides.

Mechanical Properties

Opening the session on mechanical properties, which started off the fourth day of the technical program was a report by H. J. Snyder, Mellon Institute of Industrial Research, which discussed effect of quenching and tempering on distribution of residual stress in manganese oil-hardening tool steel.

The data, which are based on work conducted at the University of Pittsburgh, indicated that the principal quenching stresses in a fullly hardened flat specimen are tensile, equal in all surface directions, and concentrated within a surface layer 0.025-inch in thick-



Schematic sketch of tester developed by U. S. Steel for measuring hardness of steels at elevated temperatures

ness. A tempering treatment progressively decreases these surface stresses until they become negligible or slightly compressive, but the tempering treatment does not affect the depth of penetration. The maximum drop in residual surface stress occurs with tempering between 125 and 650 F.

Other conclusions from the study were: 1. Etching in a 5 per cent solution of nital introduces no residual stresses. 2. lapping induces compressive stresses to a depth of 0.003 inch. 3. grinding induces unequal biaxial stresses which penetrate to a greater depth in hardened than in tempered or annealed manganese oil hardening steel.

X-ray Stress Test—Metal engineers at the mechanical properties session were called on to co-ordinate efforts in development of better x-ray methods to locate residual stresses in metals by A. L. Christenson and E. S. Rowland, Timken Roller Bearing Co. At the same time, the two researchers reported on progress they have made with an x-ray method for measurement of macro or engineering stress in both the martensitic and austenitic or hardened high carbon steel, using a General Electric back reflection spectrogoniometer.

It was pointed out that residual stress has an unquestioned relationship to distortion and failure during processing. With exception of the x-ray method, presently used techniques are destructive to the part under study and prohibit normal service tests. A limitation to their use is the likelihood of introducing spurious stress during the necessary stock removal.

The two Timken researchers emphasized this point: Control of residual stress conceivably presents the most significant gain in metallurgical design. The x-ray method offers the most attractive possibility to this approach.

Endurance Limit Unchanged—Despite widely divergent heat treatments on three batches of the same SAE 5140 steel, each to achieve a different result, an identical endurance limit was found in tests conducted at Chrysler Corp. by R. C. Chapman and W. E. Jominy.

Three different heat treatments were given to the specimens. One was to make the material brittle at room temperature. Another was the standard temper brittle treatment of furnace cooling from the tempering temperature. The third was to make the steel as ductile as possible. All treatments were selected to produce the same hardness in the steel.

Both polished and notched bars were studied in fatigue along with the tensile and impact properties at room temperature and at 35 F. Although the hardnesses were the same and the impact varied considerably, no substantial change in endurance limit could be found between the embrittled and nonembrittled material. The results also indicated no change in the notch sensitivity factor between the embrittled and nonembrittled material.

Temper Brittleness

To start-off the temper brittleness session, which followed the mechanical properties program, the effect of various heat treating cycles upon temper embrittlement of steel were reported by L. D. Jaffe and D. C. Buffum, Watertown Arsenal Laboratory and F. L. Carr, National Research Corp.

Material from one heat of SAE 3140 steel was quenched and tempered. Portions were subjected to 20 different temper embrittlement cycles involving slow and rapid heating and cooling, with and without isothermal holding at one temperature. The temperature of transition from tough to brittle fracture in the V-notch Charpy test was determined after each treatment.

The study showed that cooling to room temperature between tempering and isothermal embrittlement treatments did not affect the resulting embrittlement. Embrittlement developed more rapidly on continuous cooling than during isothermal holding at any temperature. When several embrittlement treatments were applied to the same specimen, each contributed to the embrittlement, but the combined effect often was less than the sum of the effects of the individual treatments, applied separately.

Hardness Checked — Work has also been carried out at Watertown Arsenal Laboratory to thoroughly check the effect of hardness on the level of impact energy for temper brittle and unembrittled steel. Specimen blanks of martensitic SAE 3140 steel were tempered for short periods at several temperatures between 500 and 675 C to give various hardnesses ranging from Rockwell C20½ to C38.

Comparison of energy levels in the V-notched Charpy test were made at 360 F above the temperature of transition from ductile to brittle failure. The tests showed that for steels of the same hardness the impact energy level is higher for the unembrittled than for the temper embrittled material. A linear relationship between impact energy levels and hardness was reported as existing in the hardness range of Rockwell C27 to at least C38.

Forged Steel—The results of research to determine transverse mechanical properties and other tensile data of an SAE 1045 forging steel were presented by A. H. Grobe, Vanadium-Alloys Steel Co. and Cyril Wells and R. F. Mehl, Carnegie Institute of Technology.

Among the many conclusions obtained from the exhaustive research were the following: 1. The yield strength-tensile strength ratios show a tendency to increase

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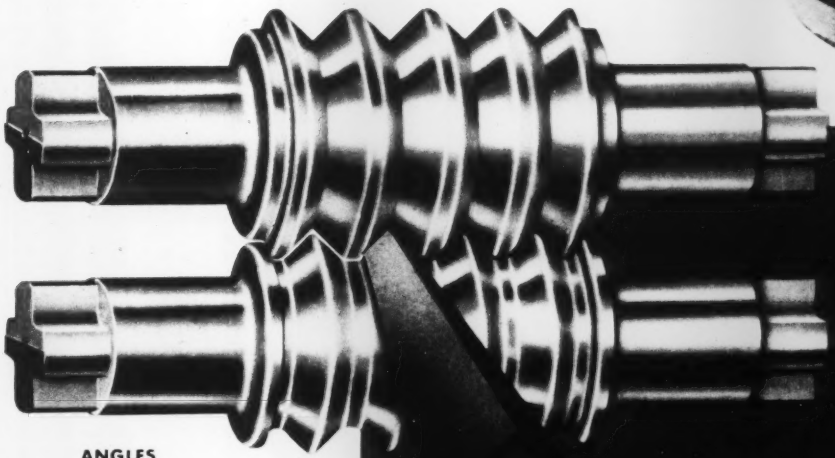

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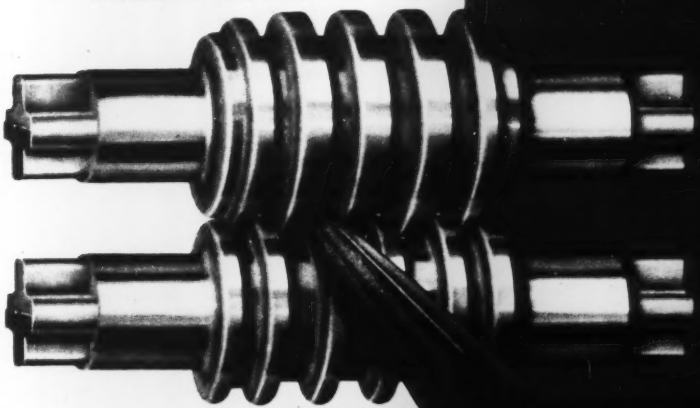

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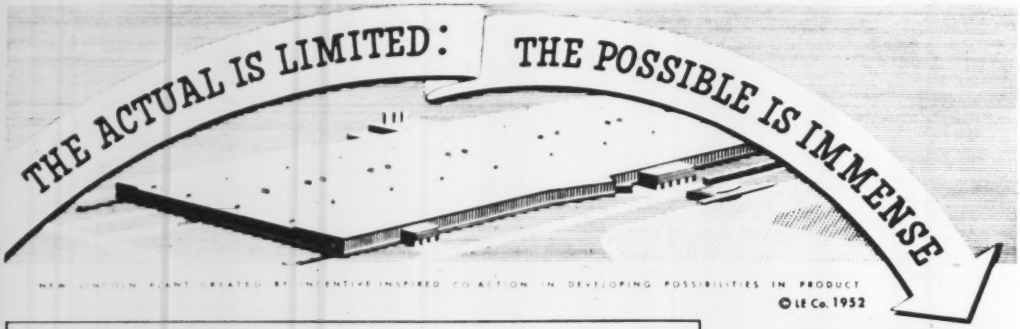

NEW FUNCTION PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED DESIGN SAVES 25% ON COST

...cuts weight 26%

By **B. L. Kopp**, Plant Manager & Chief Engineer
Carson Brothers, Inc.
Indianapolis, Indiana

WELDED design enables us to make the most efficient use of materials in the manufacture of our "Seedmaster". Formerly, it was necessary to use heavy wall sections with grav iron because of casting restrictions. With steel we now fabricate a more rigid, more dependable product using materials as light as 12 gauge. On this one machine, for example, weight was cut from 24 to 17 pounds. Since welded steel is easier to fabricate, our shop costs have been lowered by 25%. Former field service problems of breakage have been eliminated.

In addition to components shown in Figures 1 and 2, the main frame was also converted to welded steel. In place of a solid cast rectangular member, the main frame is now formed from 12 gauge steel with rolled edges for rigidity. The steel design is easier to assemble and has greater sales appeal.

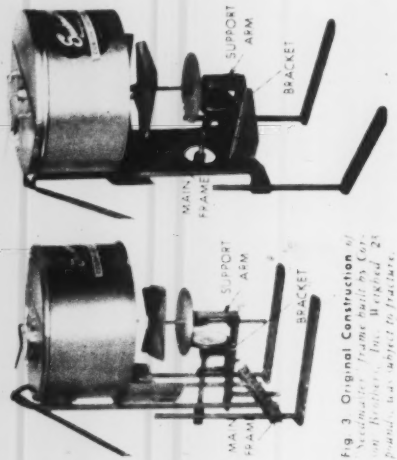

Fig. 3 Original Construction of Seedmaster frame built by Carson Brothers, Inc. Weighed 24 pounds, was subject to fracture.

Fig. 4 Present Welded Steel Design *Steel members replace cast components. Parts are lighter, but stronger in operation, yet are formed from 12 gauge sheet.*

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT LOWERS COST

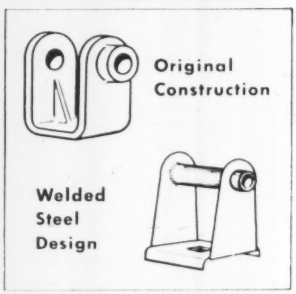

Fig. 1. Former Design *of bracket was gray iron casting. As now fabricated from 12 gauge steel, Steel design is rugged, durable, will not fracture.*

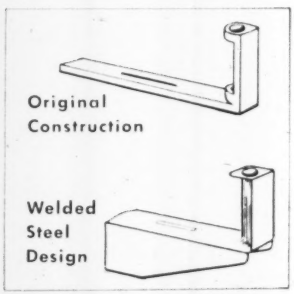

Fig. 2. Support Arm *originally a casting, required costly milling and drilling. Wall section was ½". Is now formed from 12 gauge material, has greater strength, increased rigidity, less weight.*

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as the reduction by forging is increased, with the ratio for the ingot always lower than the ratio for the forgings. 2. The angle of test practically does not affect either the yield strength or the tensile strength. 3. The average and spread for the transverse ductility and for angles to 18° from this direction do not vary significantly. 4. The average and spread for the longitudinal ductility and for angles up to 30 degrees from this direction do not vary significantly. 5. The greatest change in reduction of area and elongation takes place at angles of 20 to 54 degrees from the transverse direction.

Ultrasonic Pulse—A convenient means for measurement of elastic constants of solid materials is the ultrasonic pulse technique, according to M. B. Reynolds, Knolls Atomic Power Laboratory. In the final paper presented at the temper brittleness session, Reynolds pointed out that such measurements are nondestructive and, in addition, only one small sample of material sufficies for determination of Young's modulus, the sheer modulus and Poisson's ratio.

The technique has been used in determining elastic constants for columbium, titanium, thorium and vanadium, and in checking the elastic constants of other metals.

High Temperature Properties

Hardness of pure metals, accurately determined, may be the gage by which most other properties are indicated, J. H. Westbrook, Knolls Atomic Power Laboratory, made this suggestion in the opening paper at the session on properties of metals at elevated temperatures.

Hot-Hardness Tester—Increasing demand for alloys to withstand higher temperatures prompted three metals engineers of United States Steel Corp. to develop a tester for hot-hardness. F. Garfalo, P. R. Malenock and G. V. Smith described the method in the second paper at the high temperature meeting.

Indentor tip and metal specimen are enclosed in a laboratory furnace, which brings the sample to the desired test temperature. Loading weights are applied to balanced ends of a beam above the furnace. The specimen rests on a testing stage, elevated or depressed by both a coarse and fine screw jack adjustment beneath the furnace. At touch of a starting switch, the loaded beam which operates a perpendicular rod tipped by the indentor, is dropped.

With indentor tip and specimen at the same temperature, greater accuracy is possible in hot-hardness measurements. Sapphire indentor tips proved more satisfactory than diamond tips particularly in the range 1300-1500° F.

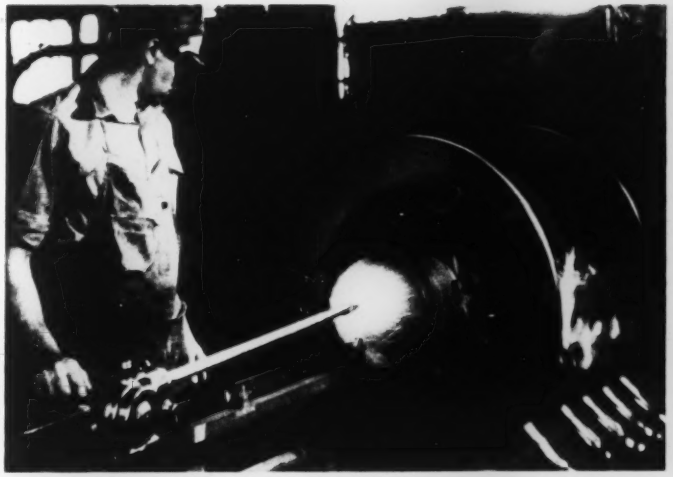
Hot Nodular Iron—Comparison of hot properties of nodular iron with those of killed carbon steel and carbon molybdenum steel were given in a report by M. S. Saunders and M. J. Sinnott based on tests conducted at University of Michigan. Short time tensile data over the temperature range 800 to 1200° F, elevated temperature impact data for various exposure periods in the same temperature range, and stress-rupture data at 1200° F were presented.

The short time tensile properties of nodular iron are equal to or better than similar properties in killed carbon and carbon molybdenum steels. High temperature impact strength is better than the room temperature strength but not as good as the two other metals. Stress-rupture impact strength at 1200° F is comparable to that obtained in carbon killed steels and carbon molybdenum steels.

Strain Aging Speeded-up—Accelerated strain aging tests have been developed by L. R. Schoenberger and E. J. Paliwoda, Jones & Laughlin Steel Corp., to assist in studying the variations in aging characteristics of rimmed and stabilized sheet and strip steels. The tests, which use gradient heating, have been developed to predict the course of age hardening and to estimate rate and severity of yield point return.

General hardness levels of rimmed steels before and after aging proved mainly a function of ferrite grain size. Greater amounts of yield elongation after six months aging were observed in finer grained material, which is in agreement with other investigators.

Faster rates of yield elongation return were observed in ordinary rimmed steels having small ferrite grains. The investigators found that tensile strength of the steels was comparatively unaffected by strain aging, the increase in strength seldom exceeding 2500 psi after six months of aging.



Engine Cylinders Metal Sprayed

Gas engine cylinder being metallized while rotating in an improvised jig set-up. Process is that of Metallizing Co. Inc., Long Island City, N. Y. Cylinders are bored, threaded, grit-blasted, degreased and sprayed with a high chrome stainless steel. Cylinders are finish-machined and honed to required size

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Studebaker's big, modern South Bend plant symbolizes the century of growth and achievement which have earned for this company an enviable reputation for high quality products and world-wide recognition as America's fourth largest manufacturer of automobiles.

How Standard's lubrication service works for Studebaker

• Look almost anywhere in Studebaker's vast plant at South Bend, Indiana, and you'll see Standard's lubrication service at work.

In one of the many operating departments, the chances are you'll find the Standard lubrication specialist who serves Studebaker. He is assigned to the South Bend area and is close at hand to give Studebaker the lubrication engineering assistance they need when they need it.

Almost any day at Studebaker's, you'll see a Standard tank wagon or truck delivering the petroleum products that help keep production rolling. Because these deliveries are made from a nearby Standard warehouse, they are prompt and reliable. Most of the petroleum products used in the Studebaker plant are stocked in this warehouse and are immediately available.

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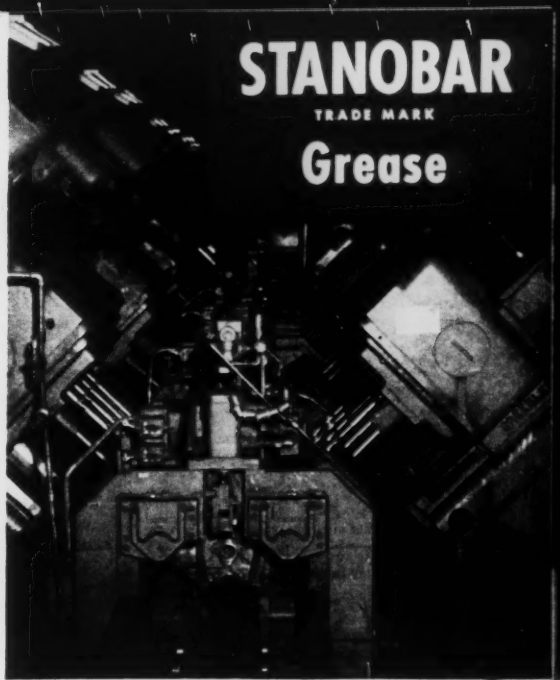

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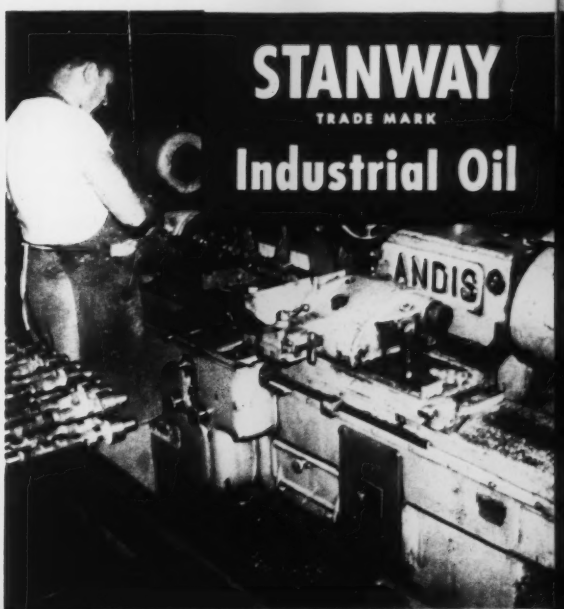
In Studebaker's many grinding machines, such as the one shown below, STANWAY Industrial Oil No. 30H answers a special need by serving both as a hydraulic oil and as a lubricant for ways and guides. The high stability necessary in a hydraulic oil and the oiliness needed in a way lubricant are uniquely combined in STANWAY.



Hidden Arc Cuts Corners

Saves fabricator the high cost of stress relieving a 75-foot all welded boom structure

SAVING the cost of stress relieving an estimated $5000 was the problem facing Puget Sound Bridge & Dredging Co., Seattle, builders of a welded boom structure for a new hydraulic dredge. Engineers advised that stress relief was vitally necessary if the 75-foot structure was expected to stand up under the pounding, twisting and shock inevitable on the job.

However, experience with similar types of structures convinced engineers of Lincoln Electric Co. that stress relief could be avoided if arc welding was done by automatic or semiautomatic hidden arc method. Where manual welding had to be done, a heavily coated electrode of the low-hydrogen type was recommended.

Excludes Air From Metal—The hidden-arc technique deposits a granular flux on the joint deep enough to cover the weld completely. This gives a dense, ductile uniform weld, since air is excluded from the metal while molten. Hidden arc also permits the use of high current density for faster welding, less metal deposition, uniform heat input and lower costs.

Despite terrific pounding in the field, no welding failures are reported from the dredging operation up in Alaska.

New Test Technique Found

IDENTIFICATION and quantitative analysis of minute amounts of elements present in very thin sections or small deposits is an easy task when using a new approach developed recently by the Research & Control Instruments Division, North American Philips Co. Inc., Mt. Vernon, N. Y.

The instrument used is a standard x-ray spectrograph employing tungsten radiation, but using a special analyzing crystal with newly developed optics. In laboratory tests dealing with thin films on stainless steel and component metals deposited on plastic and metal base materials, coatings of 6 micrograms per square centimeter or less were readily identified.

Technique Is Nondestructive—Numerous analyses have been performed by Philips on specimens consisting of iron, chromium, nickel and stainless steel alloy deposited on films of mylar plastic and on lead foil. Each specimen is scanned with the x-ray spectrograph and the spectrum recorded through an angular range suitable for the particular elements involved. Intensity measurements are made with the scaler and a fixed count operation.

By comparing the actual known weights of elements present with the counts-per-second it is apparent that the technique is very accurate. It has a distinct advantage over former techniques in that it is nondestructive; the films not being ruptured or deceased, as would be the case with spark spectrographs.

The technique can be applied to many fields where extremely small quantities of material are available either in the form of films, dusts or residues from evaporation.

CALENDAR
OF MEETINGS

October 27-29, National Lubricating Grease Institute: Annual meeting. Edgewater Beach Hotel, Chicago. Institute address: 4638 J. C. Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 27-24, American Gear Manufacturers Association: Fall meeting. Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

October 27-31, American Gas Association: Annual meeting and exposition. Municipal Auditorium, Atlantic City, N. J. Association address: 420 Lexington Ave., New York 17. Secretary & convention manager: Kurwin R. Boyes.

October 27-31, Electrochemical Society Inc.: Fall meeting. Mt. Royal Hotel, Montreal. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

October 28-23, Materials Handling Conference: Westinghouse Electric Corp., sponsor; Hotel Statler, Buffalo.

October 30-31, National Association of Aluminum Distributors: Annual convention. Del Monte Lodge, Pebble Beach, Calif.

October 30-November 2, National Tool & Die Manufacturers Association: Annual meeting. Hotel Sheraton, Rochester, N. Y. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

October 31, Blast Furnace & Coke Association, Chicago District and Eastern States Blast Furnace & Coke Oven Association: Joint meeting. Del Prado Hotel, Chicago. Meeting secretary: W. D. Miller, U. S. Steel Co., Chicago 17.

October 31-November 2, Automotive Parts Rebuilders Association: Annual meeting. Conrad Hilton Hotel, Chicago. Association address: 220 S. State St., Chicago 4. Secretary: Jack O'Sullivan.

November 3-4, Society of Automotive Engineers: National diesel meeting. Hotel Chase, St. Louis. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 5-7, Industrial Management Society: Annual time and motion study and management clinic. Hotel Sherman, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 6-9, Scientific Apparatus Makers Association: Mid-year meeting, industrial instrument, laboratory equipment, optical, aeronautical and military instrument sections. The Homestead, Hot Springs, Va. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 6-7, Society of Automotive Engineers: National fuels and lubricants meeting. The Mayo, Tulsa, Okla. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 8, American Society of Tool Engineers, Chicago Chapter: Annual midwestern tool engineering conference. Urbana, Ill. Conference arrangements: Prof. L. E. Doyle, University of Illinois.

November 8-9, Open Steel Flooring Institute Inc.: Fall meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 2311 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

November 9-11, Grinding Wheel Institute: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit. Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting. Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-13, American Petroleum Institute: Annual meeting. Conrad Hilton Hotel and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20.

November 10-14, National Electrical Manufacturers Association: Annual meeting. Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting. Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 18-20, Conference, High Energy Nuclear Physics: National Science Foundation and University of Rochester, sponsors, Rochester, N. Y.

November 19, American Standards Association: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. E. Hussey Jr.

November 19-20, Industrial Hygiene Foundation: Annual meeting and conference. Foundation address: Mellon Institute, Pittsburgh 13. Managing director: C. Richard Walmer, M. D.

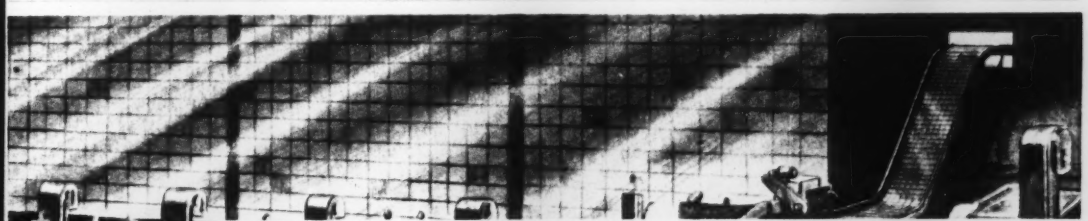
November 20-21, American Society for Personnel Administration: Fall meeting & exhibit. Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

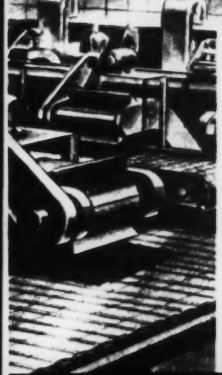
November 20-21, American Society for Quality Control: Midwest quality control conference. Hotel Claypool, Indianapolis. Conference information: Dale A. Cue, Indianapolis Section, ASQC, Box 5664, Indianapolis.

November 20-22, Galvanizers Committee, American Zinc Institute: Fall meeting. Hotel Bismarck, Chicago. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Gent.

November 21, Association of American Railroads: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 30-December 5, American Society of Mechanical Engineers: Annual meeting. Statler and McAlpin Hotels, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.





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Renaissance in Steelmaking Methods

Rising capital investment per ton of steel produced, higher labor costs and dwindling raw materials supplies spur search for entirely new techniques

By H G BATCHELLER
Chairman
Allegheny Ludlum Steel Corp
Pittsburgh

Torch cutting a 4-inch round of 302 stainless steel as it emerges from continuous casting machine in pilot operation at Allegheny Ludlum's Watervliet, N. Y., plant

STEELMAKING technology will proceed at an accelerated rate in the next few years. Not only will it develop simplified and improved methods for the mass production of steel, but truly fundamental changes will ensue.

One important effect of such revolutionary concepts will be to enable us to reduce our capital requirements per ton of steel produced. That development will aid not only in maintaining a fair rate of return on capital investment but also will attract the new capital that is needed.

For a whole half century there have been few really fundamental changes in steel production principles. Primarily we have had improvements in existing practices. The last really fundamental change was the invention of the bessemer converter.

We have seen important and even radical improvements in existing equipment but most of our progress is based on making our methods more massive, more automatic, more efficient. The continuous rolling mill, a tremendous improvement, can be cited as an example.

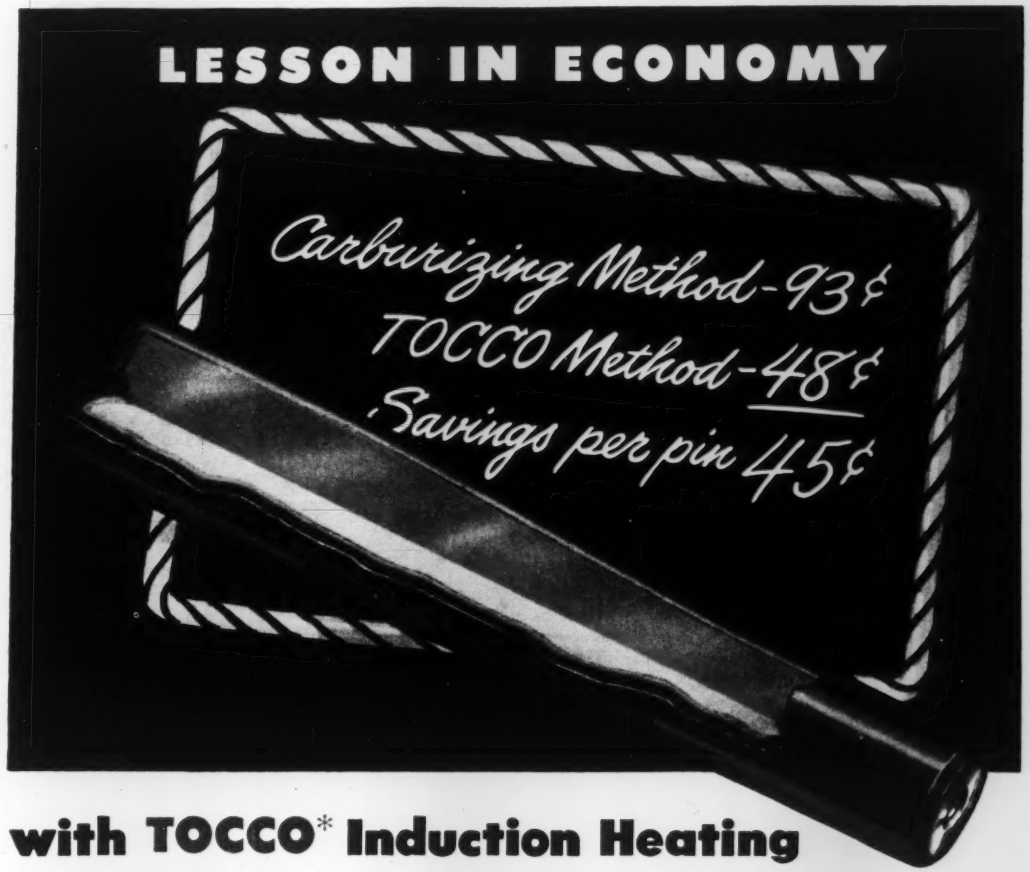
Problems Mount—Take a look at our present use of raw materials. As we see the supply of high grade domestic ores dwindling away, as we note with alarm the continual downgrading of available coking coal, we cannot help but feel the need for new techniques for producing basic metallics.

In the past, for instance, technical efforts were bent toward adapting our raw materials to our steelmaking facilities. Perhaps a new chapter of progress will open up if we can reverse that former approach and try to develop facilities that will fit the raw materials available.

Great attention is given to processes to beneficiate low-grade ores and launder low-grade coal. Important developments are approaching from the opposite direction, specifically, efforts to use low-grade materials without beneficiation.

Still the Best—For many years men have sought to replace the blast furnace with a less expensive and more economical means of producing hot metal. There have been practically as many glowing claims as attempted schemes. Various types of improved cupolas, rotary kilns and gaseous reduction furnaces were built and tested. To date none have approached the blast furnace in performance, in cost or in efficiency when applied to raw materials of the character which we still have but in lessening abundance.

The blast furnace and its multimillion dollar auxiliaries are not today replaceable. One still can't dismiss the possibility that as our supplies of high-grade materials are depleted and as we find it necessary to go farther and farther afield for replacements we may pioneer in new ways. We can fore-



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● When a leading motor truck manufacturer switched to TOCCO for surface hardening steering knuckle pins, they not only cut the cost of the part in half, but reduced heat-treating time from 17 hours to 48 seconds!

● Using TOCCO they were able to combine two operations and eliminate four others completely. Moreover, the TOCCO unit, being located right in the production line next to related operations, saves approximately 4000′ of hauling to and from the heat-treat department – an important economy factor not included in the above figures.

● If your operations involve the hardening, brazing, soldering, melting or forging of ferrous or non-ferrous metals, TOCCO can probably speed up *your* production and lower *your* costs, too. Why not ask to have a TOCCO engineer survey your plant for similar cost-cutting results—without obligation.

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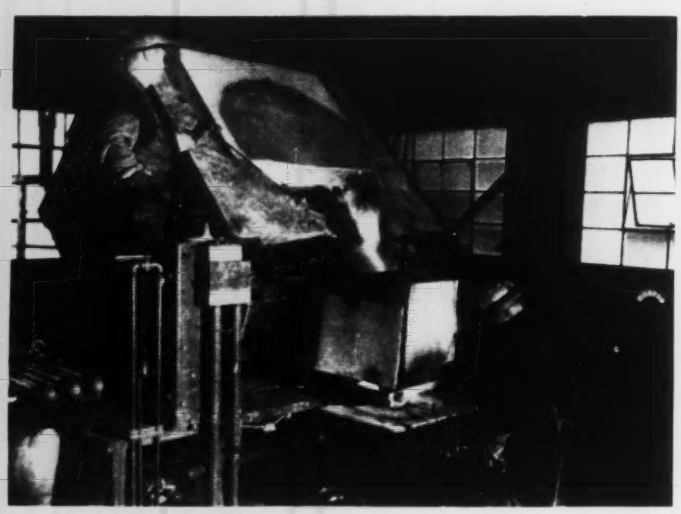
TOCCO

Induction Heating Equipment must meet the requirements of the Federal Communication Commission's Rules and Regulations Relating to Industrial, Scientific and Medical Services, Part 18. All TOCCO equipment is certified to comply with these rules and regulations.



Induction furnace at the pilot continuous casting machine. Tundish can be seen in the center and below it the head of the copper, water-cooled mold

see our engineers and scientists developing new techniques and equipment for obtaining metallics from smaller deposits of less perfect materials deposits more widely separated geographically. Perhaps these deposits will be more available to an industry now showing marked indications of decentralization.

Many other countries are eagerly and persistently working along such lines particularly in Western Europe, where supplies of high-grade ores and coking coal are seriously depleted. Whether or not the answer will come from some rotary kiln operation, or from some other direction, remains to be seen.

Producing iron from low-grade materials by cheap and simple methods is only one of the challenges to our technology.

Seek Better Ways—Refinement of steel may be due to a technological facelifting. Larger and larger open hearths and electric furnaces are being built. To the many questions asked about the development of the turbo-hearth there are few answers. It seems to offer many possibilities.

New processes for the more economical conversion of molten pig iron or synthetic scrap into steel are clearly in the offing. The ultimate furnace may well be a type which combines the advantages of the old-fashioned bessemer with those of the open hearth and the electric along with a considerably lower capital investment.

Barrels of Dollars—A large part of our present investment in steelmaking is required just for the pouring and blooming of ingots. From time immemorial, it has been the practice of the steel industry to convert ore into pig iron, and then pig iron into steel, by methods which if not perfect are still marvels of ingenuity. Then the resulting molten steel is poured laboriously into an infinite number of molds.

Process requires a tremendous capital investment in cranes, molds, and other equipment. It involves the immediate loss of 12 to 18 per cent of the steel poured into the molds that loss resulting in scrap that must be returned to the furnaces. It further results in a substantial loss of costly Btu's and many man-hours of labor each of these units becomes more costly each year.

Costs Keep Rising—Then begins another costly process, involving even more massive, more costly equipment the blooming mill. Viewing the continuing increases in the cost of the equipment and labor involved, many steelmakers will search for more simple and less costly procedures. The time may come when molten steel will be continuously cast in water-cooled molds as nearly as possible to the size and shape that after being worked, will produce the end product of required grain, size and structure.

Pilot plant operation of such a process has not yet proved, but does indicate, that substantial economies can be made. Opportunities for savings exist not only in the cost of the capital equipment involved but also in the processing of the product.

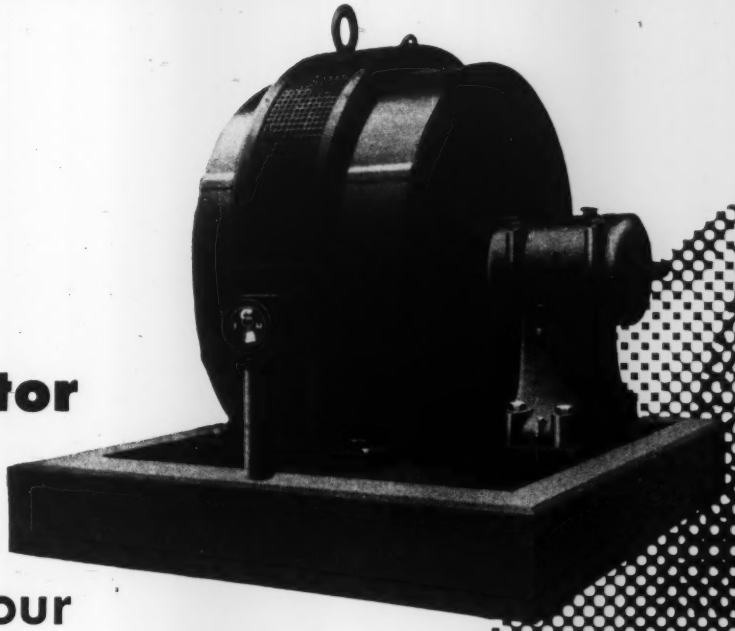
Looking Good—Other economical shortcuts include the hot and cold extrusion of steel. Hot extrusion, already appears to be an outstanding success. Several producers are operating hot extrusion presses now, or have presses in various stages of installation. Seamless tubes, intricate shapes or even bars are squirted from hot extrusion presses so economically that the saving would have amazed a steelmaker only a couple of years ago. The key to this process is the use of molten glass as a lubricant.

We should also keep our eyes on the cluster-type mills. The smallness of the work rolls, along with their ability to take high rolling pressures, already makes them useful for very thin cold rolling. It is possible that further developments in this type of mill for hot rolling could effect economies.

It doesn't take much imagination to see how the joining of the processes mentioned, to form a single integrated production unit, could be a vast step forward in steel production. If all these processes are perfected, they could serve to provide the added tonnage the crystal-gazers say will be needed during the next quarter-century—at considerably lower capital cost per ingot ton of capacity and perhaps at lower production costs.

Star Performer?—A brand new type of worker is becoming interested in engaging in our research the metallurgical physicist. Eventually his importance to the steel industry may match or even exceed that of the metallurgical chemist.

It has been left for our time to discover what the alchemist of the middle ages sought in vain a key to the transmutation of the elements. The alchemist wanted to



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For example, when you need synchronous machinery, look for the F-M Seal—as have users of over 5,000,000 horsepower of this type of equipment. That Seal is your assurance of pioneered improvements, proved design, quality manufacture and top performance—factors to figure in your future.

When you look for electric motors, look for the Fairbanks-Morse seal. For over 120 years it has stood for the finest in manufacturing integrity—to *all* industry. Fairbanks, Morse & Co., Chicago 5, Illinois.

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If your plant requires the rapid removal of heat, smoke or fume-laden air, the Burt Free Exhaust Fan Ventilator was designed for you. A Burt Axial Flow Airfoil Fan accelerates the exhaust vertically upward at high velocity. Twin dampers thoroughly weatherproof the F.E.F. open automatically to ventilate. Its high efficiency recommends it for many installations. See Sweet's or write us for Bulletin SPV-13 for a complete description of this modern Burt development.

Aerodynamically designed for the rapid removal of air, the Burt Axial Flow Airfoil Fan is not "just another propeller". It provides a high volume of air delivery efficiently and economically.

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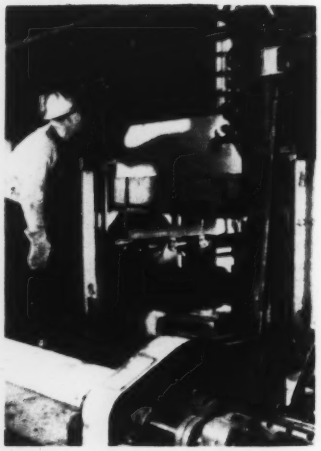

View in the middle of three floors of the pilot continuous casting unit. Casting comes from the molds and is guided downward by set of pinch rolls

transmute common metals into gold. For us, many things are now more valuable.

Alchemy in steel could revolutionize much of our thinking, along with many of our methods. The metallurgical physicist may teach us how to take apart the atomic structure of steel and put it back into a more uniform lattice-work.

This we are told could increase the strength of steels perhaps ten times over without the addition of a single alloy. Furthermore, he will almost certainly carry on the remarkable progress now being made, in effecting steel's resistance to corrosion. He will amost certainly show the way to vast improvements in steel's hardenability, machinability, tensile strength and resistance to fatigue.

Starting Point—Already we have made a small beginning in this art it will indeed be a great art, as well as a science—in our realignment of the crystal structure of some of our electrical steels. We are beginning to explore the possibilities of ultrasonic energy and of controlled beams of electrons in steel production, metallurgy and the fabrication of metals. The effect of ultrasonics on crystal growth or crystal alignment of metals is an entirely new study.

As we learn more about this new tool, we may be able to force metals into combinations impossible to achieve by any other means

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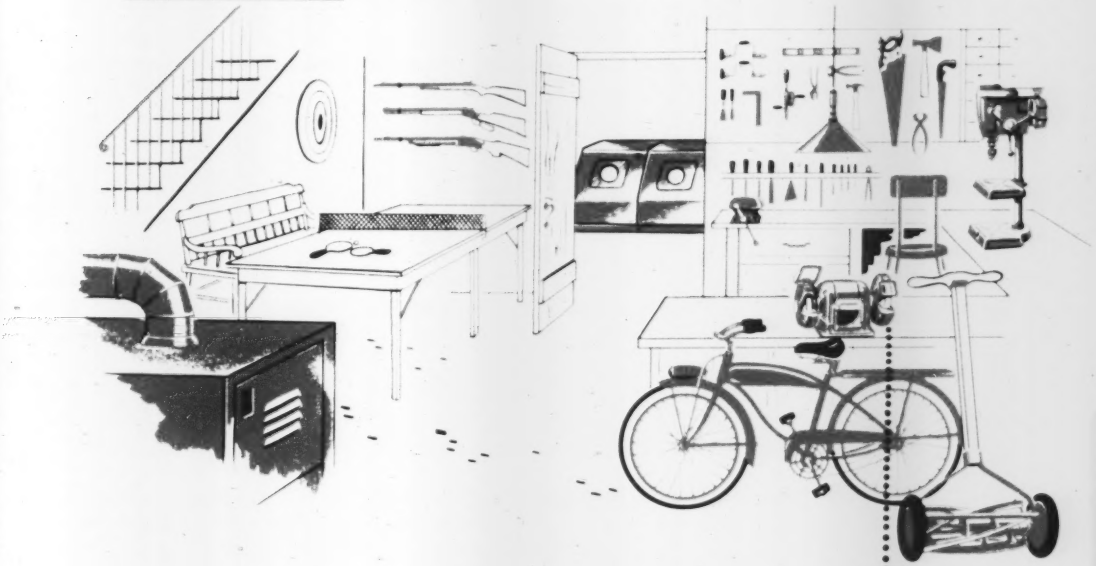
for Metalworking products...



...made in the plants reached by STEEL

You'll see products made of metal all around you when you enter your recreation room—or any other room in your home. Take a mental inventory and you'll realize what great sales possibilities you have in the industry that produces these and countless other metal products . . . to the tune of over a hundred billion dollars' worth annually. This is your Metalworking market . . . STEEL's market . . . and you reach the plants that do well over 90% of all metalworking business when you put your advertising in STEEL.

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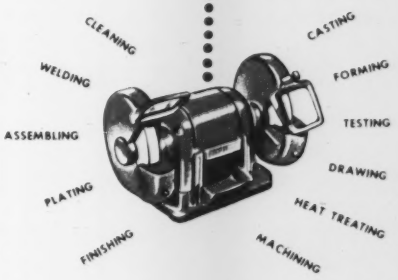
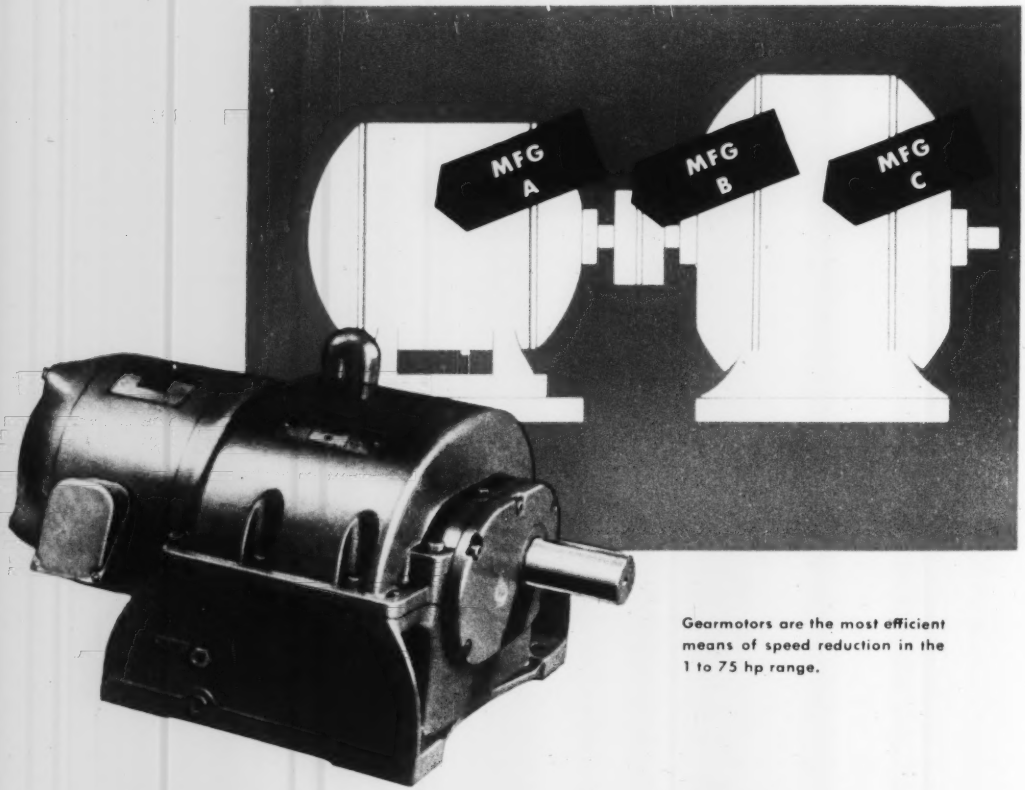


Consider the many operations that go into the making of this bench grinder . . . into the multitude of other metalworking products you'll find wherever you live, work, shop and play . . . operations that require products, materials or services like yours. Your product story in STEEL reaches the men responsible for these operations.

The magazine of the men who manage, operate, and buy for the metalworking industry



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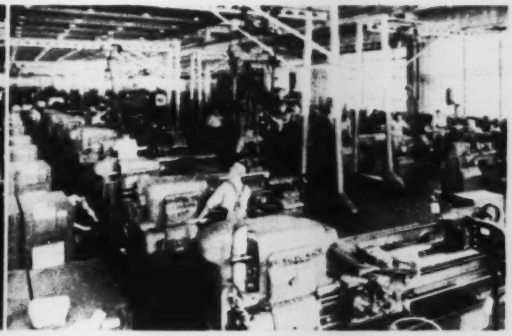
Life-Line GEARMOTORS

Illustrating Monarch's departmentalization is this view of the integrated unit for manufacturing lathe slides



Cranes are used for many operations besides transporting materials. They are available throughout the entire plant

New Plant Layout

(*Concluded from Page* 75)

cleaning and painting steps.

Rolling Along—Two water-bath paint spray booths are used; one for small and the other for medium sized castings. Small castings are moved by hand on metal grates that travel on fixed-roller conveyors. There are four conveyor lines, one of which passes through a paint spray booth.

Across both ends of all four conveyor lines run floor level tracks that support and guide roller transfer tables. These are slightly larger than the grates on which parts are carried so as to facilitate transferring grated loads from line to line. The spray line conveyor is broken by a 360-degree turntable in the middle of the booth. Medium sized castings are handled at the other booth by "mules" or overhead cranes.

From the painting stage on, the handling of the parts is entirely determined by their size and the quantities in which they are required. They are handled individually, are loaded into tote boxes or staked on platforms. Large, individual parts can be moved by any of the numerous cranes throughout the production area. Tote box or platform loads can be transported by platform truck, fork lift truck, hand mule, or in some instances, tracked dollies.

Lift Not—Cranes are used for many operations besides transporting materials. At any point during the production process where large parts must be handled, they are lifted by crane. Cranes are used to position large parts on the machine tools, to help during the fitting of parts and to facilitate final assembly operations on the erection floor.

To move large, finished lathes from east to west across the erection area, one or more floor tracked dollies are used. Placed on these dollies a lathe can be readily transferred to the west side of the plant where a west cross-travelling crane can make a lift. From this point the load is handled progressively through finish painting, crating and loading on truck or railroad car.

Individual entrances to storage areas for forgings and bar stock are located about midway of the building on the west side. These materials are handled in unitized loads.

Planning Below — A hydraulic elevator, of fire-proof design and capable of handling an 8000-pound load, connects the parts stockroom in the basement with the manufacturing floor above. It is conveniently located near a truck receiving dock at the northeast end of the plant to take care of incoming shipments of small parts and supplies. Jig and fixture racks, together with general storage racks, are located at various other points on the manufacturing floor where they are readily served by fork lift trucks and platform lift trucks.

Lumber for crates is delivered by truck or rail to the lumber stores space in the shipping department. Crates are constructed on tandem, unconnected dollies that can accommodate any length of container. As a crate is completed, it is rolled toward the finish paint position and handled from then on by the regular shipping area crane.

Departmentalization system and the new materials handling facilities, while only in effect a relatively short time, already confirm many benefits expected to stem from their adoption. Not only is the production of lathes and lathe accessories moving with a new smoothness; but a greater flexibility is imparted to manufacturing operations for producing machines.

Look Ahead—To insure that the flexibilty and usefulness of their machines will anticipate rather than simply parallel the needs of industry, Monarch has maintained an experimental engineering group since 1946. Housed in a separate building alongside the plant, engineers provided with the finest equipment available are continually exploring better methods, new processes and possible changes in design, materials and operations.

The company realizes the importance of being a primary source of the latest information on methods of metal removal, rates at which it can be removed and similar basic turning data. To this end a definite plant area is assigned for the purpose of running tests on the machinability of metals. A series of such tests is already underway on a special Mono-matic lathe equipped with the necessary, and intricate, instrumentation.

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OUR product specialist is qualified to give you expert advice on the selection of steel for a particular purpose, and on the choice of tools, equipment and machinery that can frequently speed up your production. He can interpret and develop specifications to fit your needs, and he can advise on the methods of handling the various kinds of steel and steel products during your production operations. Often he can save you time or money, or help you meet a delivery date by suggesting alternate materials for your product. And at his finger tips is the latest information about government restrictions, expected availabilities of special grades of steel, and similar subjects.

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UNITED STATES STEEL

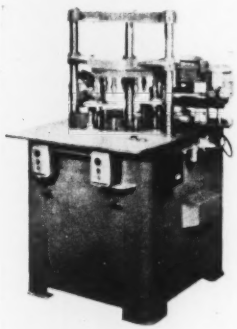
NEW PRODUCTS and equipment

Reply cards on page 117 will bring you more information on any new products and equipment in this issue

Automatic Flash Lathe

. . . speeds secondary metal jobs

Ten-spindle automatic flash lathe, with intermittent motion on the turret, is designed to speed secondary finishing operations. Spindles have a variable rate of 700 to 2000 rpm. Top wheel is adjustable up and down, wheel spin-



dles retracting for work ejection and piece loading.

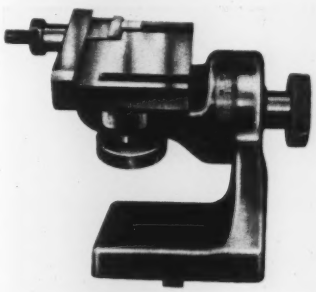
A variety of tooling can be mounted on the back table, permitting use of a 140-degree tooling arc for tool arrangement. Diameters up to $4\frac{1}{2}$ inches are accommodated and provision is made for height adjustment up to 8 inches. J. M. Nash Co., Dept. ST, 2360 N. 30th St., Milwaukee 45, Wis.

USE REPLY CARD—CIRCLE No. 1

Chaser Grinding Fixture

. . . grinds rake and lead angles

Inexpensive method for grinding tangential chasers is provided by the No. 20 chaser grinding fixture. The fixture is used to grind compound rake and lead angles. Crossarm, arranged so the chaser platen can be adjusted vertically, is supported by the base casting. This makes possible grinding of any desired rake angle. Platen can be rotated horizontally throughout a 360-degree circle to provide accur-



ate means for producing the desired lead angle.

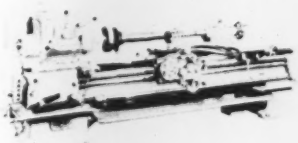
Fixture is readily adaptable for use on any grinding machine that has a traversing table, regardless of grinding wheel type employed. Chaser widths are covered from $1\frac{1}{4}$-inch to $4\frac{3}{8}$ inches. Addition of a grinding block makes the fixture applicable for widths from $\frac{7}{8}$ to $1\frac{1}{4}$-inch. Landis Machine Co., Dept. ST, Waynesboro, Pa.

USE REPLY CARD—CIRCLE No. 2

Contouring Attachment

. . . greater sensitivity, accuracy

Improved, simplified hydraulic contouring attachment developed for Springfield lathes indicates



greater sensitivity and accuracy. Complicated mechanisms and fragile units are eliminated. In their place a motor-driven hydraulic pump, relief valve and oil reservoir form a self-contained power unit that supplies pressure to the servovalve and universal hydraulic compound rest.

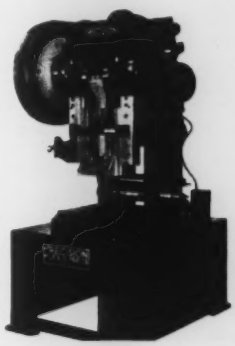
In addition, a simple electromechanical constant speed control governs a variable drive, maintaining constant cutting speed as the lathe follows a varying contour. Springfield Machine Tool Co., Dept ST, Springfield, O.

USE REPLY CARD—CIRCLE No. 3

Automatic Stamping Press

. . . range starts at 0.002-inch

High-speed automatic stamping press, the C-type Flexopress, has 30-ton capacity with integral feed rolls. Range for feeding and stamping materials starts at 0.002-inch aluminum foil, plastics and



gasket materials and reaches to heavy metals. Machine is available with either air or shot pin clutch. Speed is infinitely adjustable from 110 to 450 strokes per minute.

Ram and connecting link are high strength, light alloy material, about 35 per cent the weight of cast iron alloys. Press ram is contained on a multiple of ball bear-

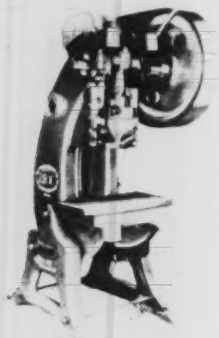
ings. Precision Welder & Flexopress Corp., Dept. ST, 138 E. McMicken Ave., Cincinnati 10, O.

USE REPLY CARD—CIRCLE No. 4

Deep Throat Press

. . . locks in any position

Work in production, toolroom or on test runs is included in the capacity of the model 28X deep throat punch press. The 28-ton tool features precision ground



parts balanced and surface finished to Brush analyzer standards. Its ground forged steel crankshaft, hand-scraped bearings and solid web wheel and gears indicate smooth, high-speed operation.

Press is readily inclinable, locking positively in any position. A simple two-button safety device protects the operator. Walsh Press & Die Co., division of American Gage & Machine Co., Dept. ST, 1709 W. Kinzie St., Chicago 14, Ill.

USE REPLY CARD—CIRCLE No. 5

Punch Press Feeder

. . . used for parts transfer

Redesigned mechanical punch press feeder broadens application in secondary die work and permits use for parts transfer operations not connected with punch presses. Operator's hands or arms are never in a danger zone.

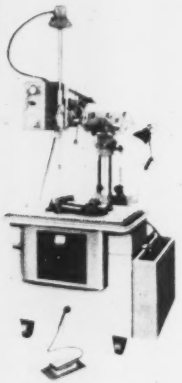
This model, designated Feed-O-Matic F-3, is equipped so pick-up can be timed to coincide with completion of a production operation or with arrival of a part at predetermined location. It provides vacuum pick up for flat parts, vacuum-controlled grip fingers for pieces that have different planes and, in special applications, a magnetic pickup. V & O Press Co., division of Emhart Mfg. Co., Dept. ST, Hudson, N. Y.

USE REPLY CARD—CIRCLE No. 6

Electron Drill

. . . cuts holes to 0.030-inch

This arc machining process tool cuts holes as small as 0.030-inch, is adjustable for finishes through coarse, fine, extra fine and super fine. Model M-300 is equipped with automatic power feed, providing continuous operation. By use of automatic feed, metal particles that create a short in drilling



cause the power feed to back out and clear itself.

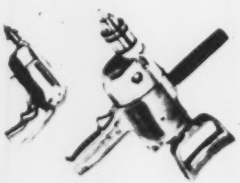
Tool is equipped to cut or drill any metal of any hardness or thickness from magnesium to steel. Elox Corp. of Michigan, Dept. ST, Clawson, Mich.

USE REPLY CARD—CIRCLE No. 7

Electric Hand Drills

. . . absorb radial load, thrust

Two electric hand drills, one with $\frac{1}{4}$-inch chuck, the other with $\frac{1}{2}$-



inch capacity special duty mold, have spindle ball-bearing construction to absorb radial load and end thrust. Both have gear-type chucks for slip-proof gripping of bits. Smaller, $\frac{1}{4}$-inch model 107 has idle speed of 2000 rpm, can drill within $\frac{3}{4}$-inch of a parallel surface and weighs 3 pounds, 6 ounces.

Model 109 has a spade handle at rear that can be changed to vertical or horizontal positions, or removed entirely. It drills within $1\frac{1}{4}$-inch of a parallel surface and weighs 9 pounds. Idle speed is 450 rpm. Porter-Cable Machine Co., Dept. ST, Syracuse 8, N. Y.

USE REPLY CARD—CIRCLE No. 8

Ball Bearing Bushing

. . . has split outer race

Ball bearing bushing, type DR-L (double row light), is for applications where space is limited. Its features include a split outer race that permits introduction of a full complement of balls. Bearings are prelubricated at the factory. Bore is available in two types adapted to either press or slip fitting. Both types will carry thrust and radial load. Split Ballbearing Corp., Dept. ST, Lebanon, N. H.

USE REPLY CARD—CIRCLE No. 9

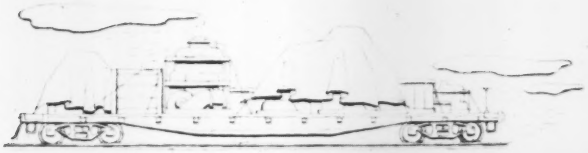
Electric Fork Truck

. . . turns in 8½-foot aisles

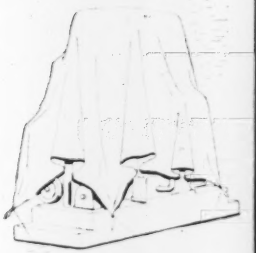
Rated for loads to 2500 pounds, this fork truck travels at speeds to 7 mph and makes U-turns in

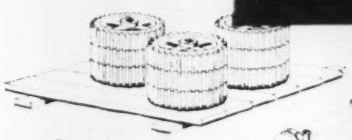
8½-foot aisles. One feature of the model FS-25 electric is its worm-gear power axle designed specifically for low-speed, high-torque truck operating conditions.

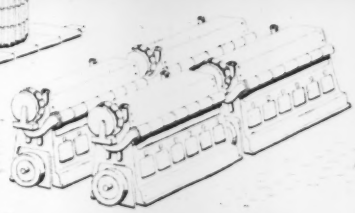
Trailing axle construction allows the model to move over uneven

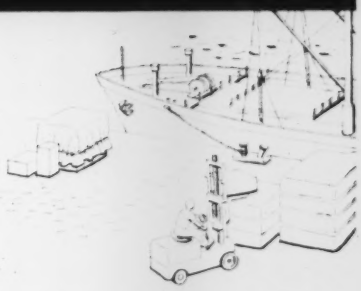


Gulf offers a complete line of *Quality Rust Preventives*









. . . a type for every duty, protection against all exposures

FROM the complete Gulf line of quality rust preventives, you can select the proper coatings to fit the desired methods of application, types of metal, length of time for which protection is required, conditions of storage or shipment, and ease of removal.

Gulf makes available both oil- and petrolatum-type rust preventives for both interior and exterior use—including the well known Gulf No-Rust C (polar type) which displaces residual moisture on metal surfaces and lays down a protective coating; and Gulf-No-Rust Engine Oils, which prevent corrosion caused by products of combustion left in internal combustion engines.

A Gulf Sales or Staff Engineer will be glad to co-operate with you in the solution of your corrosion problems. Write, wire, or phone today.

Gulf Oil Corporation · Gulf Refining Company
GULF BUILDING, PITTSBURGH, PA.

GULF SERVES INDUSTRY

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719 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, a copy of your pamphlet "Gulf Rust Preventives."

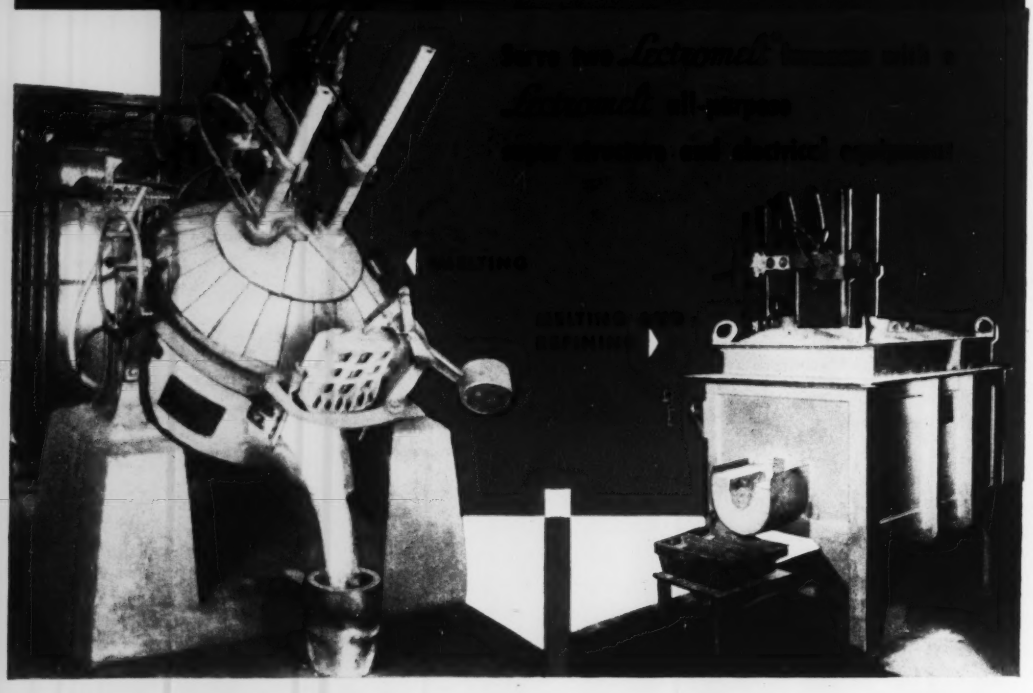
Name

Company

Title

Address

Save money in outfitting your laboratory



With these two furnace shells and the one Lectromelt superstructure, your laboratory can handle almost any problem having to do with electric furnace operations. The superstructure can be shifted from one furnace to the other, as required, along with its electrical equipment.

The combination at the left is designed for small scale, batch smelting of ores and concentrates, melting of non-metallics, melting and refining of metallics. The furnace at the right can be used for continuous operations in experimenting on the reduction of ores and melting of non-metallics.

Both furnaces can be employed with direct and indirect arcs. 50 KVA of power is available on low voltages and 100 KVA on high voltages.

Lectromelt engineers have been conducting continuing research for many years on electrothermic reductions, so they can help you put these laboratory furnaces to work proving new processes or improving the old ones. For Catalog No. 104 telling you about this service, write Pittsburgh Lectromelt Furnace Corp., 323 32nd Street, Pittsburgh 30, Pa.

Manufactured In . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

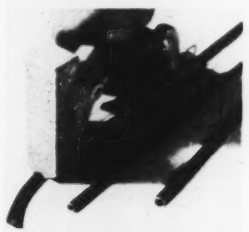
flooring or obstructions without upsetting stability. Dynamic braking feature prevents motor burnouts caused by sudden direction reversal. Truck has 130½-inch standard lift height. Baker Industrial Truck Division, Baker-Raulang Co., Dept. ST, 1230 W. 80th St., Cleveland 2, O.

USE REPLY CARD—CIRCLE No. 10

Automatic Fastening Gun

. . . eases cable installation

Hand-held, automatic fastening gun provides rapid installation of cables and hollow tube lines. Machine is operated with one hand, leaving the other free to guide lines being installed. Its force drives



bands around cables and tubes into hard surfaces.

It uses an extra-size staple band, leg lengths varying from 3/16 to ½-inch. Heller Stapler Co., Dept. ST, 2153 Superior Ave., Cleveland 14, O.

USE REPLY CARD—CIRCLE No. 11

Barrel Pump

. . . empties, fills containers

Model 101 barrel pump handles a wide range of fluids, including viscous or oily liquids. Handle is turned in one direction to drain barrel and in the opposite direction to fill barrel. Unit is self-priming, continuous flowing and nondripping. Engineered Equipment Co., Dept. ST, Box 207, Warsaw, Ind.

USE REPLY CARD—CIRCLE No. 12

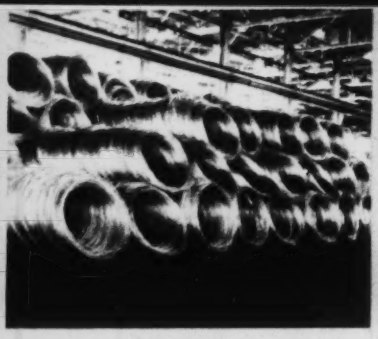
Nontelescopic Fork Truck

. . . serves small, medium plants

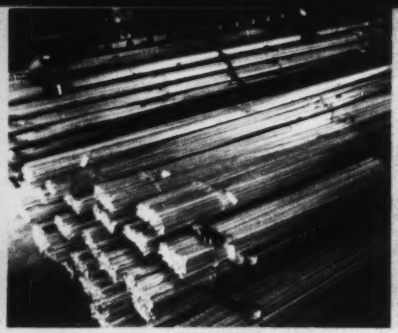
Introduction of a nontelescopic fork truck to serve small and medium-sized plants that require sufficient speed and power in a maxi-

See next week's issue for announcement of STEEL 's "Program for Management"

SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



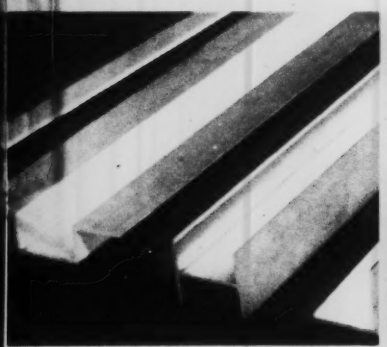
WIRE: Coiled and straight lengths; rivet wire; flattened and slit wire.



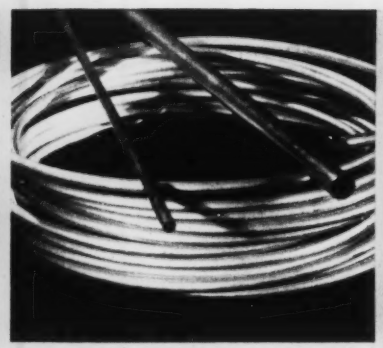
SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.

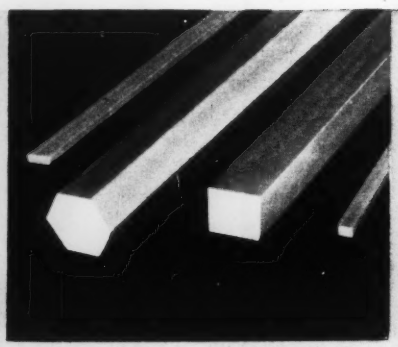
These are the MILL PRODUCTS *of* ALCOA



EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners, structural members, etc. Round, square, and rectangular bars.



TUBE AND PIPE: Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.

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They have these 12 basic advantages and scores of others

• Lightweight • High Resistance to Corrosion • High Electrical Conductivity • High Conductivity for Heat • High Reflectivity for Light and Radiant Heat • Workability • Nontoxic • Strength in Alloys • Nonsparking • Nonmagnetic • Appearance • High Scrap and Re-Use Value

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The world's greatest aluminum research and testing facilities are available to help you determine the suitability of aluminum for your products. And to train your personnel, Alcoa offers technical literature and how-to-do-it movies.

They are available from your local ALCOA sales office, distributor or jobber

For all possible co-operation in filling your orders, call your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

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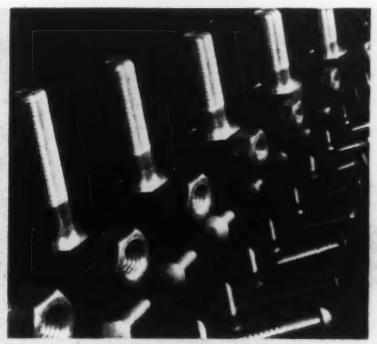
1808K Gulf Building Pittsburgh 19, Pa.



FASTENERS: Machine screws, wood screws, washers, nuts, bolts, rivets.

WELDING AND SOLDERING SUPPLIES: Welding and brazing wire, welding and brazing flux, solder flux, solder.

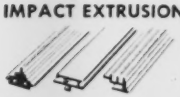
ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS . . .
sand, plaster, permanent mold and die.

FORGINGS . . .
drop, hammer and press forgings.

SCREW MACHINE SPECIALTIES . . .
special fasteners and screw machine parts.

IMPACT EXTRUSIONS



EXTRUDED SHAPES

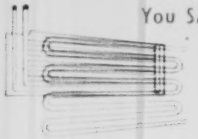
ALCOA *first in* ALUMINUM

Now Available

STAINLESS STEEL PLATECOILS

REPLACE PIPE COILS

to SAVE YOU 50% in TANK HEATING and cooling



You SAVE 50% in tank SPACE

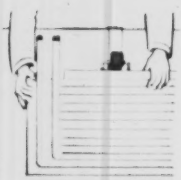
A 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil in space inside your tank.

You SAVE up to 50% in initial COST

The initial cost of stainless steel Platecoil is often 50% or more below the cost of equivalent pipe coil. Less time is required to install Platecoil with corresponding saving in installation labor.

You have 50% LESS WEIGHT to handle

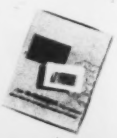
Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install it.



You SAVE 50% in maintenance LABOR

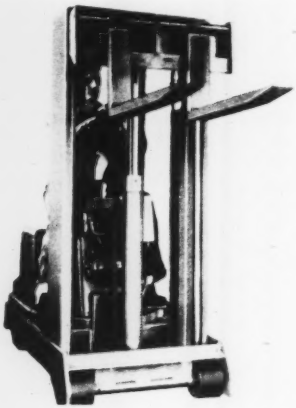
The Platecoils can be replaced in a matter of minutes and without emptying the tank. There is no need for workmen to get inside the tank in order to make replacements.

Send for your free copy of the new brochure of Platecoil applications. Write for Bulletin No. P-2.



NEW PRODUCTS and equipment

mum lifting height of 56 inches is announced by Market Forge Co., Dept. ST, Everett, Mass. It is designed to simplify operation by



use of one foot pedal to control both high and low speeds in forward and reverse. Stabilizing spring-mounted casters prevent swaying on high-speed turns.

USE REPLY CARD—CIRCLE No. 13

Hard Steel Drill

. . . features solid carbide slug

Carbide tipped hard steel drill features a solid carbide slug that is sandwich brazed to an alloy steel shank. When used on heat treated steel, the drill in no way anneals the material. A pulverized chip is formed which the drill readily expels from the table. Its size ranges from ⅛ to 1-inch in diameter in increments of 1/32-inch. Nelco Tool Co. Inc., Dept. ST, Manchester, Conn.

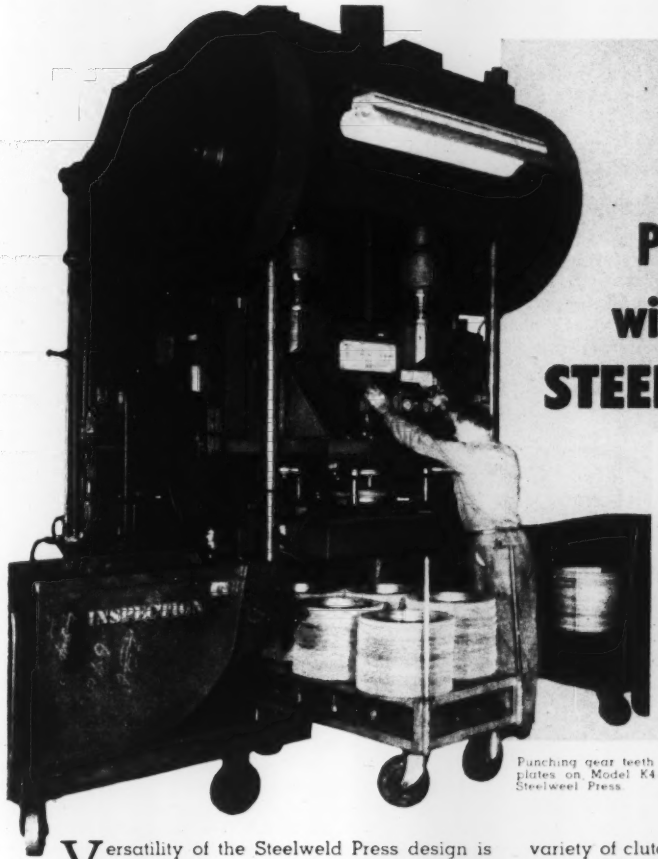
USE REPLY CARD—CIRCLE No. 14

Electronic Motor Shutoff

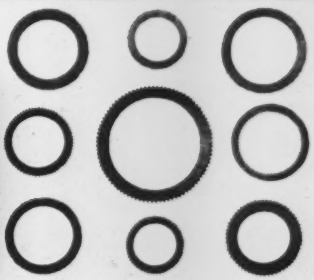
. . . protects against flooding

Industrial vacuum cleaner motors can be protected against flooding troubles with the use of an electronic motor shutoff. It is an independent wiring system that includes two electrodes mounted parallel at the base of the turbine. If a drop of water crosses these electrodes, it will cause them to break the circuit, shutting off the motor. Motor cannot be started again until electrodes are dried.

2,000 Clutch Plates Punched Per Shift with SPECIAL STEELWELD PRESS



Punching gear teeth in clutch plates on Model K44 300-ton Steelweel Press.



Some of the many plates punched on the Steelweld Press, ranging from $11\frac{3}{4}$" to $22\frac{3}{4}$" diameter, all of .089 steel.

Versatility of the Steelweld Press design is convincingly demonstrated at the S. K. Wellman Co., Cleveland, where a machine, adapted for punching purposes, turns out 2,000 clutch gear rings per eight hour shift. Equipped with a specially wide bed and ram for accommodating the dies, and vertical tie rods at front for securing necessary rigidity, the design provides an economical press with stamina required for heavy-duty service.

Installed late in 1949, the machine has been in nearly continuous operation ever since, working 24 hours a day, six days a week. A large variety of clutch plates are punched. The largest is $22\frac{3}{4}$" O.D. of 13-gauge steel, with all teeth on the outside being punched at one stroke. The heaviest clutch plates punched are of 11-gauge steel. Multiple punching and notching are also done. The gear ring discs and washers are usually run through in lots of 4,000 to 25,000 at a time.

Because of satisfaction with this press, Wellman has purchased another larger Steelweld Press to help satisfy the growing demand for "Velvetouch" clutches, plates, facings and brake linings, used widely on tractors, trucks and heavy industrial equipment.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

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To aid you in solving industrial finishing problems, The Erie Enameling Company offers *free of charge* this detailed 16-page booklet on industrial porcelain enamel. It describes the various characteristics of porcelain enamel ... presents proven examples of their effectiveness in industrial applications ... provides basic information on how to design for porcelain enamel ... tells you how to submit your finishing problem to Erie for expert analysis.

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Please send me my free copy of "Porcelain Enamel to Handle the Tough Jobs."

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NEW PRODUCTS and equipment

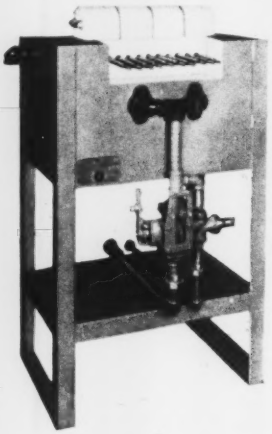
vacuum tank emptied, filter drained and motor switch turned off and back on. Multi-Clean Products Inc., Dept. ST, 2277 Ford Parkway, St. Paul 1, Minn.

USE REPLY CARD—CIRCLE No. 15

Forging, Hardening Furnace

. . . provides cold shank heating

Forging furnace heats high speed and alloy chisels properly for forging and hardening, providing true cold shank heating. Fast, uniform heating is controllable between 1200 and 2800 F. Models



are available in several sizes, with manual or automatic controls.

Operating principle is one intended to confine heat to chisel point. This prevents loss of temper in the shank during tool redressing, and cuts down shank breakage in tool use. Delaware Tool Steel Corp., Dept. ST., Wilmington 99, Del.

USE REPLY CARD—CIRCLE No. 16

Salt Spray Testing Cabinet

. . . operates off plant air

Fog-type spray testing cabinet for all ferrous and nonferrous metals, and organic and inorganic coatings, is offered by Singleton Co., Dept. ST, 10516 Western Ave., Cleveland, O. It is said to be inert to all solutions and gases used in the complete range of testing.

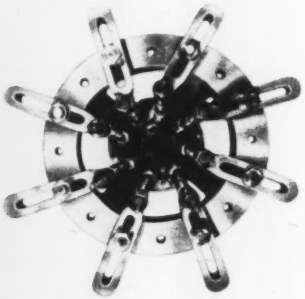
The cabinet is 36 x 24 x 36 inches I.D.; water seal trough, 2 inches wide by 3 inches deep. Atomizer operates on any plant air system and a 110-v line is sufficient for the heater. Total weight is about 160 pounds.

USE REPLY CARD—CIRCLE No. 17

Universal Joint Drilling Head

. . . adjusts to any hole pattern

A universal joint drilling head, adjustable to any pattern of holes, is available with four to twelve spindles. Head features all alumi-



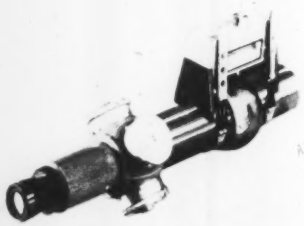
num housing construction, thrust bearings and gears turned on spindles. Unit is made in two sizes: No. 0, 0 to $\frac{1}{4}$-inch, full range of collets furnished; No. 1, 3/16 to $\frac{1}{2}$-inch, Morse taper socket or chucks for straight shank drills. Errington Mechanical Laboratories Inc., Dept. ST, Staten Island 4, N. Y.

USE REPLY CARD—CIRCLE No. 18

Optical Tooling Telescope

. . . has 30X, 45X magnification

Micro Alignment telescope is available with built-in auto-reflection unit. The instrument has



magnification of 30X and 45X, with optical micrometers to check alignment. It permits checking of 0.001-inch accuracy over distances

Easier installation with "Quikupl" made possible a reduction of 40 to 50% in time and labor when this line was installed in Feb. 1951. Since then "Quikupl" has been completely tested to complete satisfaction. Place: Precision Film Laboratories, Inc. New York.

"QUIKUPL"®

STAINLESS STEEL FITTINGS

Now . . . you can join tubing or pipe without threading, flaring, sweat-soldering, brazing or welding. Simply use "Quikupl" . . . the *completely new . . . completely tested* stainless steel fitting.

"Quikupl" cuts labor and installation time. Lines already installed show time and labor can be reduced 40 to 50%—or more. Tubing or pipe is simply cut to length, deburred and inserted into the fitting. Tightening a small screw completes the coupling. A resilient sealing ring . . . nontoxic to foods, and resistant to most chemicals . . . provides initial squeeze fit between fitting and tube or pipe. The higher the pressure, the better the sealing effect.

"Quikupl" is a money saver. You can use Schedule 5, the lightest pipe made—or tubing with even a lighter wall. You pay less per foot because you buy only the wall thickness needed to do the job.

"Quikupl" couplings, tees, adapters and elbows (45° and 90°) are available from Frasse warehouse stock in Types 304 and 316 Stainless Steel—tube and pipe sizes range from 1" O.D. to 4" O.D.

Facts about "Quikupl" fittings and how you can save with them are outlined in Frasse Engineering Memorandum #7. Send for your copy today.

Call FRASSE 1st FOR STAINLESS STEEL

Bars • Sheets • Strip • Plates • Wire
Tubing • Pipe • Valves • Fittings

GET FACTS

4748

Peter A. FRASSE and Co., Inc.
17 Grand Street
New York 13, N. Y.

Gentlemen: Please send me your Engineering Memorandum #7 containing complete facts about "Quikupl" stainless steel fittings.

Name _____ Title _____

Firm _____

Address _____

Peter A. FRASSE and Co., Inc.

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Walker 5-2200	Baldwin 9-9900	Washington 2000	Syracuse 73-5241

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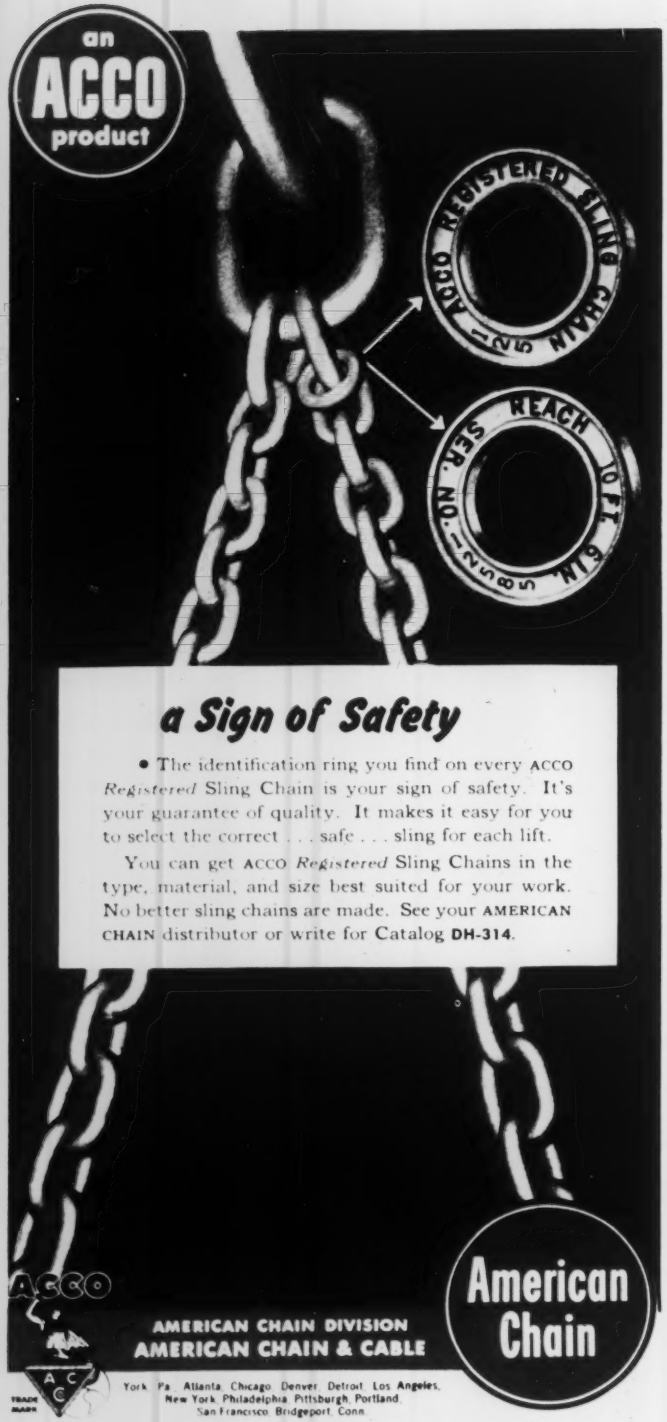


a Sign of Safety

• The identification ring you find on every ACCO *Registered* Sling Chain is your sign of safety. It's your guarantee of quality. It makes it easy for you to select the correct . . . safe . . . sling for each lift.

You can get ACCO *Registered* Sling Chains in the type, material, and size best suited for your work. No better sling chains are made. See your AMERICAN CHAIN distributor or write for Catalog **DH-314**.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

NEW PRODUCTS and equipment

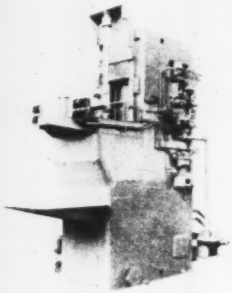
from 18 inches to more than 150 feet. Also determined is squareness of mirror targets. Engis Equipment Co., Dept. ST, 431 S. Dearborn St., Chicago 5, Ill.

USE REPLY CARD—CIRCLE No. 19

Pull-Down Broaching Machine

. . . machines spindle parts

Pull-down broaching machine, equipped with interchangeable base fixtures and tooling, broaches round and serrated holes in seven different tank arm and spindle parts. Holes broached are about



$3\frac{1}{4}$ to $3\frac{1}{2}$ inches diameter. To gain stability, machine slide and retriever slide move on the same ways.

Hydraulic receding work slide, interlocked to the machine cycle, facilitates loading, increasing productivity. American Broach & Machine Co., Dept. ST, 415 W. Huron, Ann Arbor, Mich.

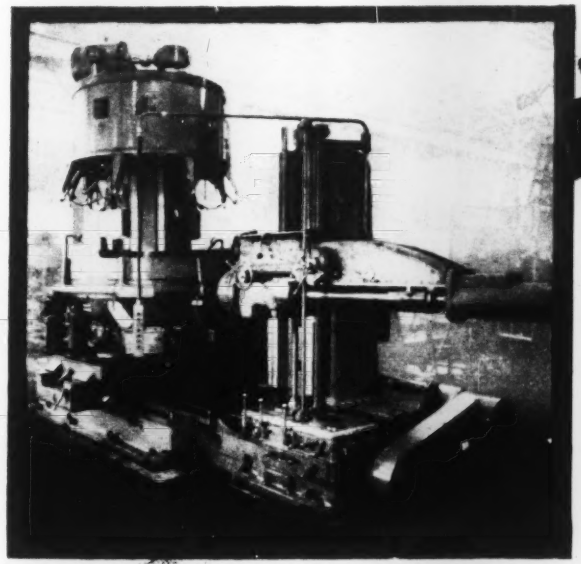
USE REPLY CARD—CIRCLE No. 20

Lift Works in Outside Storage

. . . standard capacity doubled

Addition of three models in a Power King series that more than double capacity of its standard models is made by Tracto-Lift Co., Dept. ST, 2011 Baltimore Ave., Kansas City, Mo. Trucks are designed to simplify handling bulky and heavy materials on rough, unpaved ground.

Lifting capacities extend from 10,000 to 15,000 pounds. Fork lengths range from 36 to 108 inches in 6-inch variations. The models climb inclines up to 20 per



This load was placed as illustrated. Hand cranking was used on both table and saddle and both were moved with comparative ease considering the 18½ ton load.

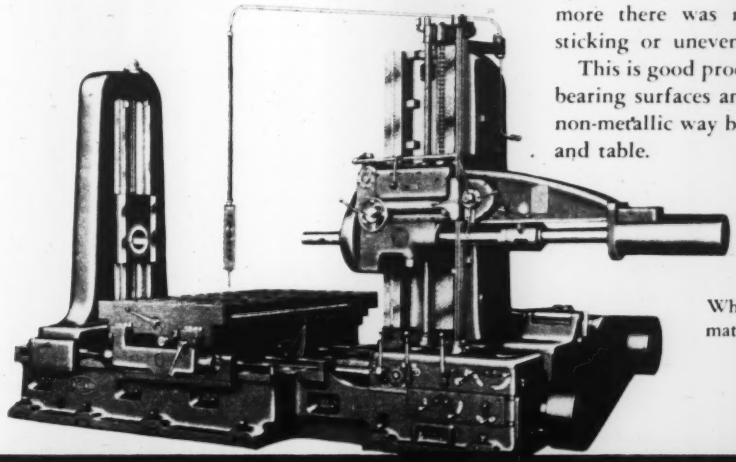
No Trick . . . Actual Test

37,000 lb. LOAD . . .

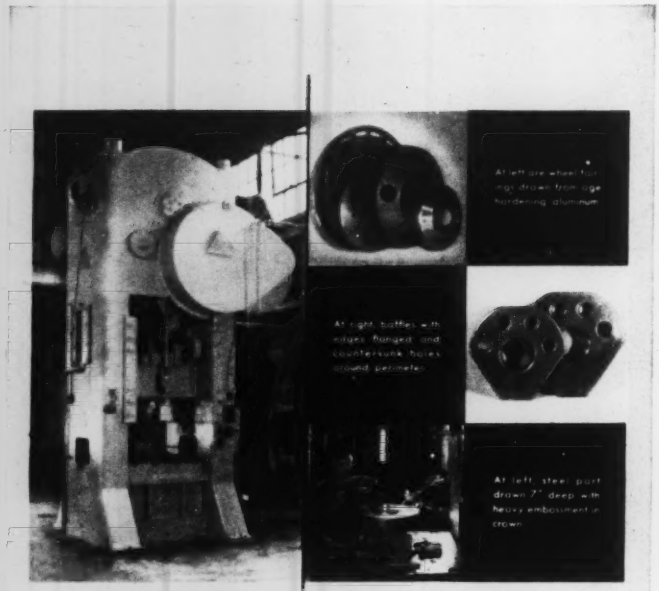
To test the load distribution and ease of action of the table and saddle on the BULLARD new 4-WAY BED HORIZONTAL BORING MACHINE, this test was actually made by placing a Type "D" MULT-AU-MATIC on the table.

Fine power feed and rapid traverse were then applied and movements made in all directions with extreme smoothness and no overloading of the hydrodynamic drive or drive motor. Furthermore there was no tendency toward sticking or uneven motion.

This is good proof of well distributed bearing surfaces and the smoothness of non-metallic way bearings of the saddle and table.



When writing for information refer to BU 206.


At left are wheel forgings drawn from age hardening aluminum
At right, baffles with edges flanged and countersunk holes around perimeter
At left, steel part drawn 7" deep with heavy embossment in crown

VARIETY SHOW

From 13 gauge to one-half inch plate . . . From hot rolled steel to age hardening aluminum . . . Whatever the task assigned to it, this Clearing 400 ton crankless press has been giving dependable service for more than ten years at Leake Stamping Company of Monroe, Michigan. Clearing presses are built to give dependable performance with low maintenance costs whatever the production requirements may be.

It's always a good idea to look to Clearing for help whenever your production problems involve the forming of metal.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ✕ CHICAGO 38, ILLINOIS
HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

NEW PRODUCTS and equipment

cent, have 6 speeds forward and reverse and a 12-inch underneath clearance.

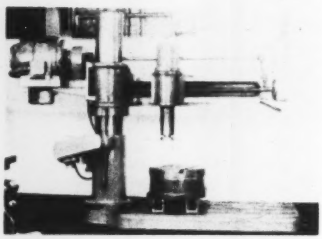
USE REPLY CARD—CIRCLE No. 21

Gate-Riser Cutoff Machine

. . . removal in one operation

Cutoff machine for all types of nonferrous castings performs complete gate and riser removal in one operation. Radial-type cutoff is reported to eliminate manual operations of chipping, bandsawing and grinding.

Cutter carriage moves laterally on a 6-foot swinging arm. Cutter



arm rides on a 10-inch thrust bearing and can be rotated in a 360-degree arc, cutting up to a 55-inch radius. Arm can be adjusted vertically to a height of 40 inches. A revolving table, pneumatically operated, is available as an accessory for circular castings. Acme Saw & Mfg. Co., Dept. ST, 1447 E. 47th St., Cleveland 3, O.

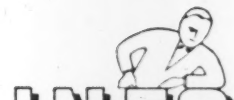
USE REPLY CARD—CIRCLE No. 22

Sump Tank Cleaning Machine

. . . operates on vacuum principle

Sump tank cleaner, model 20-T, is introduced by W. R. Carnes Co., Verona, Wis. The unit operates on a high vacuum principle so nothing but air passes through the pump unit. Model is made in tank capacities of 100, 150 or 200-gallon capacity. Each tank is fitted with

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.



INFORMATION

AVAILABLE FOR THE ASKING

72. Sheet Metal Fabricator

Wales-Strippit Corp.—Details of the new Wales sheet metal fabricator which features Hydra-New-Matic drive are given in 8-page illustrated catalog 10-A. This versatile machine will punch, shear, notch and cut. Interchangeable punches and dies are available for hole diameters ranging from 3/32 to 3½ in.

73. Foundry Mechanization

Allis-Chalmers Mfg. Co.—16-page illustrated bulletin No. 25B6092C is entitled "Foundry Mechanization." Modern foundry equipment described includes shakeouts, screens, motors, starters and controls for sand conditioning systems, casting cleaning pumps, combination dry-coolers, solids-handling pumps, crushers, vibrating screens, cupola blowers, furnace controls, dielectric core dryer and power generation and distribution equipment.

74. Aluminum Tube Fittings

Parker Appliance Co.—Twelve aluminum Triple-lok tube fitting shapes available from standard stock are described and illustrated in bulletin 4316B2. They are for application to hydraulic and other fluid handling systems where the economy and efficiency of aluminum tube systems can be used to advantage.

75. Shovel-Type Scoop

Towmotor Corp.—To get the scoop on the Towmotor Scoop, a shovel-type lift-truck accessory for handling free-flowing or loose materials, get data sheet 25275. Methods of operation, products handled and full specifications are presented.

76. Dust & Fume Control

American Wheelabrator & Equipment Corp.—"Industry Relies on Dustube for Efficient Dust and Fume Control" is well-illustrated booklet that tells how cloth tube type dust collectors are handling complex problems in 33 industries. Primary and secondary metal smelting are two of the metal processing industries covered. Equipment is described in all types of processing and manufacturing plants.

77. Molded Cups

Garlock Packing Co.—You'll find complete information on molded cups for pump pistons, hydraulic service and pneumatic equipment in 6-page folder AD-145. Illustrations of various types of cups, service data and a complete list of sizes and part numbers are included. Typical applications are shown.

78. Production Facilities

Lombard Corp.—Company's engineering and production facilities, plus typical extrusion sections produced are effectively illustrated in 10-page brochure No. 52. Typical operations are listed, and how company functions is briefly explained.

79. Die-Less Duplication

O'Neil-Irwin Mfg. Co.—36-page illustrated Die-Less Duplicating catalog No. 52-19 and supplementary quotation sheets give all needed information for selecting and using line of hand and power sheet metal fabricating machines. Described are pipe, tube and bar benders; rod parters; shears; punch press; standard, finger and radius brakes; and hand rollers. These machines are adaptable for short or production runs of duplicate metal parts.

80. Stampings, Tools, Dies

Dickey-Grabler Co.—Line of steel stamps of various types, roller marking dies, embossing dies, type holders, type for embossing and stamping, multi-wheel numbering machines and nameplate detail presses made by this company is illustrated and their specs given in 16-page catalog. Many available steel stamp symbols are shown. All are offered in a variety of sizes.

STEEL 10-27-52
Penton Building, Cleveland 13, Ohio

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81. Safety Gloves & Garments

Wiex-Merit Glove Co.—4-page illustrated condensed catalog contains brief descriptions of line of gloves and mitts for all types of industrial service. Also covered are leather overalls, aprons, jackets, mitts and shoulder-sleeves for body protection.

82. Stampings, Trimmers, Etc.

Dayton Rogers Mfg. Co.—Here is variety. You'll find data on this varied line in 12-page catalog: stampings in small lots, molded plastics in small lots, pneumatic die cushions and counterbalance cylinders, drawn shell trimmer, hydraulic overload pitman, micrometer adjustable spacing collars and layout fluid.

83. Optical Comparators

Jones & Lamson Machine Co.—Interesting information on the basic optical comparator principle, how the J. & L. machine is used for lateral, vertical and angle measuring; various attachments available; types of staging fixtures and much technical data are yours for the reading in 32-page catalog No. 802. Specifications for each of the several comparator models are given and examples of parts that are being measured in industry are shown.

84. Air & Hydraulic Valves

Beckett-Harcum Co.—Included in line of Beckett Hi-Cyclic air and hydraulic valves described in 8-page illustrated bulletin No. 10A are reciprocating, spring loaded, hand operated solenoid, air time delay and piloted valves. Cross-sectional diagrams and specifications are included.

85. Drills

Ace Drill Corp.—In addition to complete line of standard "Ground-from-the-Solid" drills, such unusual stock items as drills for plastics, 12-in. Longhoy drills, drill blanks, centerless ground reamers, solid carbide drills and Hi-Brinell drills for hardened steel are presented in illustrated 56-page catalog. Included are cutting fluid recommendations, step-by-step procedures for pointing a drill, cutting speeds, and table of regular drill sizes.

86. Cutting Tools

Gorham Tool Co.—It's easy to understand why this company's slogan is "There is a Gorham Tool to do every cutting job" once you have seen 120-page illustrated loose-leaf catalog and price list T-37100. Types of tools described include milling cutters, keyseat cutters, end mills, concave and convex tools, saws, bits and cut-off blades, centers, turning tools and carbide tools. Engineering data offers guidance in selection and use of tools.

EDITORIAL REPRINTS:

87. Boron Steel Behavior

High savings in nickel and molybdenum have accrued by substitution of boron steels at International Harvester. Their application to the manufacture of case-hardened gears, however, presents difficulties. A. S. Jameson, Supervisor of company's metallurgical research labs discusses some of these problems in STEEL reprint "Carbon Content Determines Boron Steel Behavior."

88. Metals For The Jets

Piston engines mean friction, but jet engines mean heat. High temperatures plus corrosive atmospheres, radiation, stress and short supply make the metallurgist's job difficult. Dr. A. G. Gray, Technical Editor, in STEEL reprint "Metals in the Jetomic Age" discusses these problems with consideration of such metals as molybdenum, titanium, zirconium, vanadium, ductile chromium, improved magnesium, aluminum and ceramic coated metals.

89. Nondestructive Testing

Rising costs make it important to detect component defects before manufacturing time is wasted. Every physics principle is used in tests that make interiors as visible as exteriors. In STEEL reprint "Quality with Fewer End-Product Failures," S. A. Wenk of Battelle Memorial Institute discusses x-ray, dry powder, ultrasonic, magnetic induction and fluorescent penetrant methods of nondestructive testing.

90. Automotive Research

Research in metallurgy is an important part of the program being carried out in the General Motors Research Laboratories. The main problem is better corrosion resistance for painted and plated parts. "Automotive Research, Trailblazer for Metalworking" is STEEL reprint which covers this program, the benefits from which are spreading in many directions and improving metal quality throughout all industry.

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Penton Building, Cleveland 13, Ohio

10-27-52

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a sludge compartment that contains a removable basket with a 100-pound capacity. This basket is lined with a replaceable fabric filter bag that retains the solids such as chips, sludge, etc.

USE REPLY CARD—CIRCLE No. 23

Head and Tailstock Positioner

. . . resembles lathe in operation

Large pieces are rotated between centers by the model HTS5 head and tail stock positioner introduced by Aronson Machine Co., Arcade, N. Y. Tables are the face plates and the workpiece is attached to them. Rotation is in one plane only—the horizontal rotational axis.

Operation is described as similar to a lathe with much slower speeds of 1.13 rpm. Operations are primarily for manual or automatic welding. Model has a 500-pound capacity. Magnetic brake motor is operated with magnetic reversing starter. Control is exerted by 110-v circuit on remote pushbutton station.

USE REPLY CARD—CIRCLE No. 24

Coolant Pump, Motor Assembly

. . . functions as complete system

Simplified coolant pump and motor assembly that functions as a complete coolant system when immersed is introduced by Factory Tools Inc., 4706 W. Arthington, Chicago 44, Ill. Built-in vane type pump, driven by a fully-sealed 1/30-hp motor delivers coolant or oil through a 4-foot long semi-rigid flexible metal hose. Variable volume hoze nozzle permits wide selection of coolant flow.

Supporting legs of the assembly are threaded to permit height adjustment of the pump and motor for the container and the coolant level.

USE REPLY CARD—CIRCLE No. 25

USE A REPLY CARD

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Angier

Vapor from Paper

STOPS RUST

Now parts are quickly *stored* clean to *stay* clean

No messy oil or grease to apply . . . no "cleaning" to do. Not when VPI Wrap protects bare metal parts from corrosion.

Think of the time you save. A textile machine firm reports that cleaning time saved every month on 400 VPI-wrapped units is 10 man-weeks.

Parts for storage (in-process or for inventory) are always clean and ready for instant use. Products to be shipped are packaged *faster* with VPI. And because they are received clean and rust-free, customers will regard your use of VPI a point in your favor.

How it works and *what is saved* are told in our free booklet "VPI Facts". For your copy, write to the most experienced name in vapor rust preventives . . . Angier Corporation, Framingham 8, Mass.

Angier VPI* *Wrap*

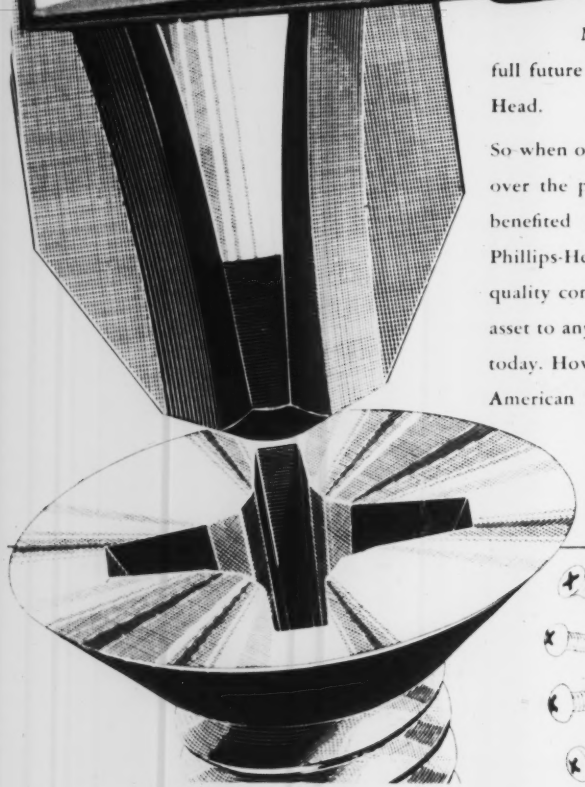
The PROVEN *Vapor Rust Preventive*

Distributors in Principal Cities *® U.S. Pat. Off.

THE AMERICAN STORY

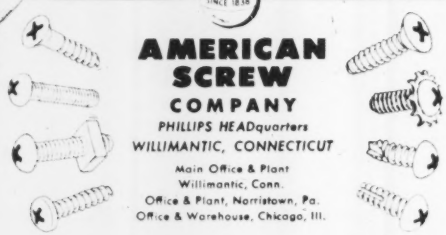
CHAPTER 2:

"The Crystal Ball" that proved the doubters wrong



Many looked into it . . . but American saw the full future of the "screwy" idea of the Phillips Recessed Head.

So when others said *no*, American said *yes*. And as a result, over the past 16 years, industry all over the world has benefited from the speed and cost-control that only Phillips-Head Fasteners can give. That idea, plus American quality control and quantity production, is a tremendous asset to any manufacturer fighting to keep his costs down today. How are *you* doing? Maybe there's something that American Phillips Screws can do for you now. Write:



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

The Market Outlook

DON'T BE MISLED into believing there will be further cutbacks in the supply of steel for civilian uses.

From the latest press conference of R. A. McDonald, administrator, National Production Authority, came reports that looked like a new cut's in store for the supply of steel for consumer durable goods. Mr. McDonald was merely saying allotments of steel are going to be what he said several weeks ago they would be for the first quarter in 1953, only in his latest pronouncement he used different terms in expressing it.

HE MEANT THIS—What he said several weeks ago is this: Allotments of steel in the first quarter of 1953 for consumer durable goods will average 60 per cent of the allotment for them in the third quarter of 1952.

That didn't mean less steel would be available in the first quarter of the new year. The remainder of the steel produced in the first quarter is to be used to fill orders carried over from the third and fourth quarters as a result of the two-month steel strike. Thus, makers of consumer durable goods would get as much steel in the first quarter as they have been allotted in any recent quarter.

MAY GET MORE—They even might get more. Barring effects of a coal strike, an all-out war or some other cataclysm, steel production should be record-breaking in the first quarter, for steel capacity is still growing and will continue to do so for some months yet.

At the rate the steel industry is catching up on deliveries delayed by the steel strike not much of the first quarter may be needed to finish the job of becoming current. That situation would make it necessary for the NPA to issue additional allotments to consumers. Such extra allotments might specifically state what steel products they can be used for, rather than be blanket authority, as allotments now are, to buy any kind of steel. Aim would be to move the products in greatest supply without putting further pressure on tight products, such as large carbon bars, heavy plates and seamless tubing.

NEW DEAL WANTED—Indication that the steel industry is making substantial headway in becoming current on deliveries is the revelation by the auto industry that it will have received delivery by the end of 1952 on all steel the NPA permits it to have for this year. Since none of 1953 will be needed, say the auto makers, to get delivery on their 1952 steel, they want NPA authorization to get a full allotment of steel in the first quarter.

GOING AFTER IT—To press their demands, the auto makers will be in Washington on Oct. 27 and 28. The job as they see it is to convince the planners that if they have tickets they'll get steel.

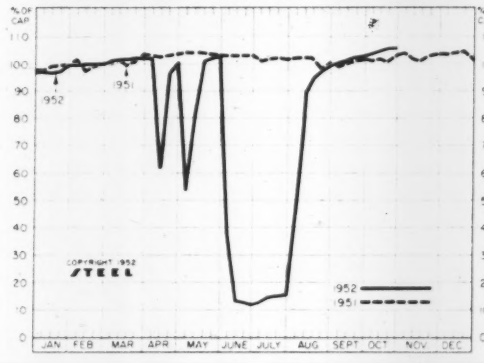
What hasn't been ascertained yet is whether all producers of consumer durable goods have been able to do as well as the automakers in placing orders for steel.

STEADY PACE—The strong production pace that's being counted on to clean up the steel order backlog at an early date was interrupted slightly in the week ended Oct. 25. A short-lived labor dispute in a Buffalo mill dropped steelmaking operations sharply in that district and prevented the industry from attaining its scheduled output. As a result the national steelmaking rate remained unchanged at the all-time record set in the preceding week, 105.5 per cent of capacity, which yielded 2.2 million net tons of steel for ingots and castings.

DANGER—Threatening to choke steel production was the work stoppage in the coal industry. While coal stockpiles are large, Youngstown steel plants revealed they would be affected within two weeks by a miners' work stoppage. Those steel plants have three to four weeks' supplies of coal and coke but would not be able to operate that long, because of the need to protect their coke plants.

Mills are currently doing all right on other raw materials. Most of them have good supplies of scrap, and iron ore stocks are good, considering the shipping time lost during the steel strike.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Oct. 25	Change	Same Week 1951	Same Week 1950
Pittsburgh	106.5	0.5*	102	105
Chicago	110.5	+ 1*	106.5	105.5
Mid-Atlantic	96	0	96	106
Youngstown	106	1	106	106
Wheeling	96	2	102	97
Cleveland	110.5	+ 3*	101.5	101
Buffalo	95	11.5	104	104
Birmingham	106	+ 4	104	100
New England	91	3	99	92
Cincinnati	90	3	103	106
St. Louis	110	0	104	95
Detroit	110	+ 0.5*	101	106
Western	103	1	104.5	99.5
Estimated national rate	105.5	0	103	102.5

Based on weekly steelmaking capacity of 2,077,040 tons in 1952, 1,999,034 tons for 1951, 1,982,721 tons for second half, 1950, 1,996,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook p. 35 Production-Engineering News—p. 71

Composite Market Averages

FINISHED STEEL PRICE INDEX
Bureau of Labor Statistics

	Oct. 21, 1952	Oct. 14, 1952	Month Ago	September Average
Composite (1947-49=100)	190.7	190.7	190.7	190.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Oct. 21, 1952

Units are for lb except where otherwise noted below in parentheses. For complete description of products see chart following p. 25, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$3.275
Track spikes	6.650	Sheets, galv.	6.995
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv. buttweld (100 ft)	8.902
Structural shapes	4.200	Boilers, carbon (100 ft)	11.664
Bars, hot rolled (lb)	3.926	Tin plate (100 lb base box)	8.950
Bars, 1020 alloy	6.550	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.349	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.475
Bars, reinforcing	4.068	Nails (100 lb keg)	7.390
Bars, C.F. carbon	5.025	Wire, barbed (on rod spools)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod rolls)	13.420

FINISHED PRICE INDEX, Weighted
Calculated by STEEL*

	Oct. 21, 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. 100)	184.31	184.31	184.31	171.92	128.96
Index (each per lb)	4.912	4.912	4.912	4.667	3.499

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished Steel, NT	$110.00	$110.00	$110.00	$106.32	$75.41
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	36.59
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.13
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.13
Composite Scrap, GT	43.00	43.00	43.00	43.00	42.38

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 94; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on greatest production point.

FINISHED MATERIALS	Oct. 21, 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R. del. Philadelphia	4.302	4.302	4.302	4.223	3.318
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, std. del. Philadelphia	4.13	4.13	4.13	3.945	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, CR., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.85-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.25
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ⅜-⅝", Pitts.	4.325	4.325	4.325	4.10-30	2.925

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Philadelphia	59.25	59.25	59.25	56.61	38.84
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry. del. Phila.	59.75	59.75	59.75	57.11	39.14
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry., Birm. del. Cin.	58.93	58.93	58.93	55.43	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	44.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$43.00
No. 1 Heavy Melt., E. Pa.	43.50	43.50	43.50	42.50	42.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.00	42.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	43.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	41.75
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	39.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	54.00
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00	48.50

Each shipping point. —

COKE, Net Ton					
Beehive, Furn. (Connsv.)	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry. (Connsv.)	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	23.00	23.00	23.00	23.00	17.50

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Maximum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
Alabama City, Ala. B2	50.88	51.38		
Birmingham, B2	50.88	51.38		
Birmingham, S9		51.38		
Woodward, Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo, B2	54.50	55.00	55.50	
Buffalo, H1	54.50	55.00	55.50	
Tonawanda, N.Y. W12	54.50	55.00	55.50	
No. Tonawanda, N.Y. T9		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester, N.Y. del.	57.02	58.02	58.52	
Syracuse, N.Y. del.	58.02	59.12	59.62	
Chicago District				
Chicago, I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50		55.00	
Indiana Harbor, Ind. I-2	54.50		55.00	
So. Chicago, Ill. W14	54.50	55.00	55.00	
So. Chicago, Ill. Y1	54.50	55.00	55.00	
So. Chicago, Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich. del.		61.30	61.30	
Cleveland District				
Cleveland, A7	54.50	55.00	55.00	55.50
Cleveland, R2	54.50	55.00	55.00	
Canton, O. del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50			55.50
Duluth, I-3			55.00	
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1		59.25	59.75	
Fontana, Calif. K1	60.50	61.00		
Granite City, Ill. G4	56.40	56.90	57.40	
St. Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton, Utah, C11	54.50	55.00		
Geneva, Utah, C11	54.50	55.00		
Lonestar, Tex. I-6	50.50	*51.00	51.00	
Minnequa, Colo. C10	56.50	57.50	57.50	
Rockwood, Tenn. T3			58.50	
Pittsburgh District				
Neville Island, Pa. P6		55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Bessemer, Pa. U5	54.50		55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50			55.50
McKeesport, Pa. N3	54.50			
Monessen, Pa. P7	56.50			
Sharpsville, Pa. S6			55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	
Youngstown, Y1	54.50	55.00	55.00	
Youngstown, U5	54.50			55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

* Low phos. southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo, H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Oct. 23, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif. K1 ... 83.00
Houston S5 ... 65.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $59.00
Clairton,Pa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 59.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
So.Duquesne,Pa. U5 ... 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 70.50
Canton,O. R2 ... 70.50
Clairton,Pa. U5 ... 70.50
Cleveland R2 ... 70.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.50
Ensley,Ala. T2 ... 70.50
Fairfield,Ala. T2 ... 70.50
Fontana,Calif. K1 ... 89.50
Gary,Ind. U5 ... 70.50
Geneva,Utah C11 ... 70.50
Houston S5 ... 78.50
Johnstown,Pa. B2 ... 70.50
Lackawanna,N.Y. B2 ... 70.50
Los Angeles B3 ... 89.50
Munhall,Pa. U5 ... 70.50
Seattle B3 ... 89.50
So.Chicago R2,U5,W14 ... 70.50
So.Duquesne,Pa. U5 ... 70.50
So.SanFrancisco B3 ... 89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $76.00
Buffalo R2 ... 76.00
Canton,O. R2 ... 76.00
Canton,O. T7 ... 78.00
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 76.00
Fontana,Calif. K1 ... 95.00
Gary,Ind. U5 ... 76.00
Houston S5 ... 84.00
Ind.Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 76.00
So.Chicago R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... $87.50
Canton,O. R2 ... 87.50
Cleveland R2 ... 87.50
Fontana,Calif. K1 ... 108.50
Gary,Ind. U5 ... 87.50
Massillon,O. R2 ... 87.50
So.Chicago,Ill. R2 ... 87.50
So.Duquesne,Pa. U5 ... 87.50

SHEET BARS (NT)
Fontana,Calif. K1 ... $80.00

SKELP
Aliquippa,Pa. J5 ... $3.65
Munhall,Pa. U5 ... 3.55
Warren,O. R2 ... 3.55
Youngstown R2, U5 ... 3.55

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.325
Buffalo W12 ... 4.325
Cleveland A7 ... 4.325
Donora,Pa. A7 ... 4.325
Fairfield,Ala. T2 ... 4.325
Fontana,Calif. K1 ... 5.125
Houston S5 ... 4.725
Johnstown,Pa. B2 ... 4.325
Joliet,Ill. A7 ... 4.325
KansasCity,Mo. S5 ... 4.675
LosAngeles B3 ... 5.125
Minnequa,Colo. C10 ... 4.575
Monessen,Pa. P7 ... 4.325
No.Tonawanda,N.Y. B11 ... 4.325
Pittsburg,Calif. C11 ... 4.975
Portsmouth,O. P12 ... 4.525
Roebling,N.J. R5 ... 4.425
So.Chicago,Ill. R2 ... 4.325
SparrowsPoint,Md. B2 ... 4.425
Sterling,Ill.(1) N15 ... 4.325
Struthers,O. Y1 ... 4.325
Torrance,Calif. C11 ... 5.125
Worcester,Mass. A7 ... 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.45
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind.Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S5 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif.(22) P1 ... 4.56
Phoenixville,Pa. P4 ... 6.10
Seattle B3 ... 4.50
So.Chicago,Ill. U5, W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10

Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 4.85
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.80
Bessemer,Ala. T2 ... 5.80
Bethlehem,Pa. B2 ... 5.80
Clairton,Pa. U5 ... 5.80
Fairfield,Ala. T2 ... 5.80
Fontana,Calif. K1 ... 6.40
Gary,Ind. U5 ... 5.80
Geneva,Utah C11 ... 5.80
Ind.Harbor,Ind. I-2 ... 5.80
Ind.Harbor,Ind. Y1 ... 6.30
Johnstown,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
LosAngeles B3 ... 6.35
Munhall,Pa. U5 ... 5.80
Seattle B3 ... 6.40
So.Chicago,Ill. U5 ... 5.80
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ... 5.50
Bethlehem,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
Munhall,Pa. U5 ... 5.80
So.Chicago,Ill. U5 ... 5.75

BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.95
Bessemer,Ala. T2 ... 5.95
Clairton,Pa. U5 ... 5.95
Cleveland R2 ... 5.95
Conshohocken,Pa. A3 ... 6.20
Ecorse,Mich. G5 ... 6.90
Fairfield,Ala. T2 ... 5.95
Fontana,Calif.(30) K1 ... 6.55
Gary,Ind. U5 ... 5.95
Geneva,Utah C11 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Johnstown,Pa. B2 ... 5.95
Munhall,Pa. U5 ... 5.95
Pittsburgh J5 ... 5.95
Seattle B3 ... 6.85
Sharon,Pa. S3 ... 5.95
So.Chicago,Ill. U5 ... 5.95
SparrowsPoint,Md. B2 ... 5.95
Warren,O. R2 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 5.35
Coatesville,Pa. L7 ... 5.75
Conshohocken,Pa. A3 ... 5.55
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 5.25
Johnstown,Pa. B2 ... 5.25
Munhall,Pa. U5 ... 5.25
Sharon,Pa. S3 ... 5.75
So.Chicago,Ill. U5 ... 5.25
SparrowsPoint,Md. B2 ... 5.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind.Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ... 4.15
Cleveland,c.l. R2 ... 4.50
Warren,O.,c.l. R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.90
Aliquippa,Pa. J5 ... 3.90
Ashland,Ky. (15) A10 ... 3.90
Bessemer,Ala. T2 ... 3.90
Clairton,Pa. U5 ... 3.90
Claymont,Del. C22 ... 4.35
Cleveland,J5, R2 ... 3.90
Coatesville,Pa. L7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.90
Fontana,Calif.(30) K1 ... 4.50
Gary,Ind. U5 ... 3.90
GraniteCity,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.90
Harrisburg,Pa. C5 ... 6.50
Houston S5 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.90
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Minnequa,Colo. C10 ... 4.70
Munhall,Pa. U5 ... 3.90
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Steubenville,O. W10 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.65
Geneva,Utah C11 ... 5.00

PLATES, Wrought Iron
(Add 4.7¢ to base and extras)
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.50
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
No.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta,A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco S7 ... 5.00

BAR SIZE ANGLES, H.R.CARBON
Bethlehem,Pa. B2 ... 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.675
Buffalo R2 ... 4.675
Canton,O. R2 ... 4.675
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.675
Detroit R7 ... 4.825
Ecorse,Mich. G5 ... 5.025
Fontana,Calif. K1 ... 5.725
Gary,Ind. U5 ... 4.675
Houston S5 ... 5.075
Ind.Harbor,Ind. I-2, Y1 ... 4.675
Johnstown,Pa. B2 ... 4.675
KansasCity,Mo. S5 ... 5.275
Lackawanna,N.Y. B2 ... 4.675
LosAngeles B3 ... 5.725
Massillon,O. R2 ... 4.675
Midland,Pa. C18 ... 4.30
So.Chicago R2,U5,W14 ... 4.675
So.Duquesne,Pa. U5 ... 4.675
Struthers,O. Y1 ... 4.675
Warren,O. C17 ... 4.675
Youngstown U5 ... 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind.Harbor,Ind. I-2 ... 5.925
IndianaHarbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.675
Struthers,O. Y1 ... 6.425
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B5 ... 4.975
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago B5 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.075
Donora,Pa. A7 ... 4.925
Elyria,O. W8 ... 4.925
Franklin Park,Ill. N5 ... 4.925
Gary,Ind. R2 ... 4.925
GreenBay,Wis. F7 ... 4.925
Hammond,Ind. I-2, M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles R2 ... 6.375
Mansfield,Mass. B5 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. A5 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Waukegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B5 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.99
Carnegie,Pa. C12 ... 6.00
Chicago B5 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.00
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Donora,Pa. A7 ... 6.00
Elyria,O. W8 ... 6.00
Gary,Ind. R2 ... 6.00
Hammond,Ind. I-2, M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B5 ... 6.45
Massillon,O. R2, R8 ... 6.00
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
So.Chicago,Ill. R2, W14 ... 6.00
SpringCity,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Waukegan,Ill. A7 ... 6.05
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.95
Atlanta,A11 ... 4.50
Buffalo R2 ... 3.95
Cleveland R2 ... 3.95
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.75
Niles,Calif. P1 ... 4.65
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
SandSprings,Okla. S5 ... 4.85
Seattle B3, N14 ... 4.70
So.Chicago,Ill. R2 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
SparrowsPoint,Md. B2 ... 3.95
Sterling,Ill.(1) N15 ... 4.65
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Youngstown R2 U5 ... 3.95

BARS, Reinforcing
(Fabricated to Consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown,¾-1" B2 ... 4.75
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.25
Seattle B3, N14 ... 5.80
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¾-1" B2 ... 4.75
Williamsport Pa. S19 ... 5.10

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin,Pa.(3,4) F3 ... 4.75
FortWorth,Tex.(26) T4 ... 5.10
Huntngt.W.Va.(3) W7 ... 5.75
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 4.05
Tonawanda(3,4) B12 ... 5.00
Williamsport(3) S19 ... 5.25
Williamsport(4) S19 ... 5.35

BARS, Wrought Iron
(Add 4.7¢ to base and extras)
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.Bbl) B14 ... 11.90
Economy(Staybolt) B14 ... 12.20
Mc&K Rks.(Staybolt) L5 ... 14.50
Mc&K Rks.(S.R.) L5 ... 9.60
Mc&K Rks.(D.R.) L5 ... 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(8) A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.175
Detroit M1 ... 4.40
Ecorse,Mich. G5 ... 3.975
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.725
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.875
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 5.425
Pittsburg,Calif. C11 ... 4.475
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.775
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. R1 ... 5.825
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.575

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.625
Gary,Ind. U5 ... 5.675
Ind.Harbor,Ind. I-2 ... 5.675
Ind.Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(35) B2 ... 5.675
Munhall U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(36) B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.475
Fairfield,Ala. K1 ... 7.675
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
IndianaHarbor,Ind. I-2 ... 6.925
Irvin,Pa. U5 ... 6.925
Lackawanna(37) B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(38) B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold Rolled Steel (Commercial Quality)

Butler Pa. A10	4.575
Cleveland 15, R2	4.575
Dover O. G6	4.575
Fairfield Ala. T2	4.575
Follansbee W.Va. F4	4.575
Fontana Calif. K1	4.575
Gary Ind. U5	4.575
Granite City Ill. G4	4.575
Ind Harbor Ind. I-2, Y1	4.575
Ironton O. I6	4.575
Lackawanna N.Y. B2	4.575
Middletown O. A10	4.575
Pittsburgh, Calif. C11	5.025
Pittsburgh, J5	4.575
Sparrows Point Md. B2	4.575
Steubenville O. W10	4.575
Warren O. R2	4.575
Weirton W.Va. W6	4.575
Youngstown, Y1	4.575

SHEETS, Galv'd No. 10 Steel

Alabama City Ala. R2	5.075
Ashland Ky. (48) A10	5.075
Carnegie Pa. P2	5.075
Follansbee O. S16	5.075
Dover O. R1	5.075
Fairfield Ala. T2	5.075
Gary Ind. U5	5.075
Ind Harbor Ind. I-2	5.075
Irvin Pa. U5	5.075
Kokomo Ind. (15) C16	5.425
Martins Ferry O. W10	5.075
Niles O. N12	5.225
Pittsburg, Calif. C11	5.525
Sparrows Pt. Md. B2	5.075
Steubenville O. W10	5.075
Torrance, Calif. C11	5.525
Weirton W.Va. W6	5.075

SHEETS, Galvanized No. 10 High Strength Low-Alloy

Ind Harbor Ind. I-2	7.625
Sparrows Point Md. B2	7.775

SHEETS, Galvannealed Steel

Canton O. R2	5.625
Irvin Pa. U5	5.625
Kokomo Ind. (15) C16	6.025
Niles O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler Pa. A10	5.325
Middletown O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 .028"	5.925
Niles O. R2 .028"	5.925
Weirton W.Va. W6	5.775

SHEETS, Well Casing

Ind Harbor Ind. I-2, Y1	5.10
Pittsburgh, Calif. C11	5.275

BLUED Stock, 29 ga.

Follansbee O. S16	7.00
Follansbee W.Va. F4	7.10
Follansbee (22) F4	8.425

SHEETS, Enameling, Iron

Ashland Ky. (48) A10	4.925
Cleveland R2	4.925
Gary Ind. U5	4.925
Granite City G4	4.925
Ind Harbor Ind. I-2	4.925
Irvin Pa. U5	4.925
Middletown O. A10	4.925
Niles O. N12	4.925

TIN PLATE, Electrolytic, Base Box

	0.25 lb	0.50 lb	0.75 lb
Aliquippa Pa. J5	$7.40	$7.65	$8.05
Fairfield Ala. T2	7.50	7.75	8.15
Gary Ind. U5	7.40	7.65	8.05
Granite City Ill. G4	7.40	7.65	8.05
Ind Harbor Ind. I-2, Y1	7.40	7.65	8.05
Irvin Pa. U5	7.40	7.65	8.05
Niles O. R2	7.40		
Pittsburg, Calif. C11	8.15	8.40	8.80
Sparrows Point Md. B2	7.50	7.75	8.15
Weirton W.Va. W6	7.40	7.65	8.05
Yorkville O. W10	7.40	7.65	8.05

SHEETS, SILICON, H R or C R (22 Ga.) COILS (Cut lengths 72" & lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Beech Bottom W.Va. W10			8.50	9.10	9.90
Brackenridge Pa. A10			8.50	9.10	10.10
Granite City Ill. G4 (cut lengths)			8.50	9.80	
Ind Harbor Ind. I-2	7.50	7.50	8.50	9.10	9.90
Mansfield O. K6 (cut lengths)	7.20	7.20	8.50	9.10	9.90
Niles O. N12 (cut lengths)	8.00	8.00	8.50	9.80	
Vandergrift Pa. U5			8.50	9.60	10.40
Warren O. R2	7.50	7.50	8.50	9.60	10.40
Zanesville O. A10			8.50	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths 72" & lower)

Transformer Grade	72	65	58	52
Beech Bottom W.Va. W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge Pa. A10	10.00			
Vandergrift Pa. U5	10.00	11.50	12.20	13.00
Warren O. R2	10.00			
Zanesville O. A10	10.00	11.50	12.20	13.00

H R or C R COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler Pa. A10 (C R)			13.35	13.85
Vandergrift Pa. U5	13.50	14.35	15.35	15.85

BLACK PLATE Base Box

Aliquippa Pa. J5	$6.25
Fairfield Ala. T2	6.60
Irvin Pa. U5	6.60
Yorkville O. W10	6.70
Granite City Ill. G4	6.50
Ind Harbor Ind. I-2, Y1	6.50
Niles O. R2	6.50
Pittsburg, Calif. C11	7.25
Sparrows Point Md. B2	6.60
Warren O. R2	6.60
Weirton W.Va. W6	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee W.Va. F4	6.10
Gary Ind. U5	6.10
Granite City Ill. G4	6.30
Ind Harbor Ind. Y1	6.10
Irvin Pa. U5	6.10
Yorkville O. W10	6.35

SHEETS, Culvert No. 16 Pure Iron

	Cu	Cu
		Alloy	Fe
Ashland Ky. A10	5.75		
Ashland Ky. A10	5.75	6.125	
Canton O. R2	5.75	6.125	
Fairfield Ala. T2	5.75	6.125	
Gary Ind. U5	5.75	6.125	
Ind Harbor Ind. I-2	5.75	6.125	
Irvin Pa. U5	5.75	6.125	
Kokomo Ind. C16	6.525		
Martins Ferry O. W10	5.75		
Pittsburg Cal. C11	6.625		
Sparrows Pt. B2	5.75		
Torrance Cal. C11	6.625		

SHEETS, Culvert, No. 16 Pure Iron

Ashland Ky. A10	6.125
Fairfield Ala. T2	6.125
Martins Ferry O. W10	6.125

SHEETS, Hot Rolled Ingot Iron 18 Gage and Heavier

Ashland Ky. A10	4.025
Cleveland R2	4.375
Ind Harbor Ind. I-2	4.025
Warren O. R2	4.375

SHEETS, Cold Rolled Ingot Iron

Butler Pa. A10	5.075
Cleveland R2	5.175
Middletown O. A10	5.075
Warren O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland Ky. A10	5.325
Canton O. R2	5.325

SHEETS, ZINCGRIP Ingot Iron

Butler Pa. A10	5.625
Middletown O. A10	5.575

SHEETS, ALUMINIZED

Butler Pa. A10	8.425

TINPLATE, American 1.25 lb. Coke (Base Box)

	1.50 lb	1.75 lb
Aliquippa Pa. J5	$8.70	$8.95
Fairfield Ala. T2	8.80	9.05
Gary Ind. U5	8.70	8.95
Ind Harbor Ind. I-2, Y1	8.70	8.95
Irvin Pa. U5	8.70	8.95
Sparrows Point Md. B2	8.70	8.95
Warren O. R2	8.70	
Weirton W.Va. W6	8.70	8.95
Yorkville O. W10	8.70	8.95

MANUFACTURING TERNES (Special Coated)

Fairfield Ala. T2	$7.45
Gary Ind. U5	7.75
Irvin Pa. U5	7.75
Yorkville O. W10	7.75

SHEETS, LT Coated Ternes, 6 lb

Yorkville O. W10	$8.50

SHEET, Mfg Ternes, 8 lb (Commercial Quality)

Gary Ind. U5	$9.75
Yorkville O. W10	9.75

SHEET, Long Terne Steel (Commercial Quality)

Beech Bottom W.Va. W10	5.475
Gary Ind. U5	5.475
Mansfield O. K6	6.05
Middletown O. A10	5.475
Niles O. N12	6.275
Weirton W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown O. A10	5.875

ROOFING, SHORT TERNES (8 lb Coated)

Gary Ind. U5	9.75

STRIP, Hot Rolled High Strength Low-Alloy

Bessemer Ala. T2	5.65
Conshohocken Pa. A2	5.90
Beaver Meth. G5	6.30
Fairfield Ala. T2	5.65
Fontana Calif. K1	6.55
Gary Ind. U5	5.65
Ind Harb. Ind. I-2	5.65
Ind Harbor Ind. Y1	6.15
Lackawanna N.Y. B2	5.70
Los Angeles Calif. B3	6.40
Seattle (25) B3	5.65
Sharon Pa. S3	5.95
So. San Francisco (25) B3	6.40
Sparrows Point Md. B2	5.70
Warren O. R2	5.65
Weirton W.Va. W6	5.50
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold Rolled High Strength Low-Alloy

Cleveland A7	7.45
Cleveland A7	7.30
Dover O. G6	8.00
Beaver Meth. G5	8.15
Lackawanna N.Y. B2	7.50
Sharon Pa. S3	7.30
Sparrows Point Md. B2	7.60
Warren O. R2	7.30
Weirton W.Va. W6	7.50
Youngstown Y1	7.80

STRIP, Hot Rolled Carbon

Ala City Ala. (25) R2	5.225
Alton Ill. E1	4.200
Ashland Ky. (48) A10	4.250
Atlanta A11	4.275
Bessemer Ala. T2	4.225
Bridgeport Conn. (10) S15	4.225
Buffalo (25) R2	4.225
Butler Pa. A10	4.250
Carnegie Pa. S18	4.250
Conshohocken Pa. A2	4.125
Detroit M1	4.400
Beaver Meth. G5	4.050
Fairfield Ala. T2	4.225
Fontana Calif. K1	4.975
Gary Ind. U5	4.225
Ind Harbor Ind. I-2, Y1	4.225
Ironton Pa. (25) B2	4.225
Kansas City Mo. (10) S5	4.400
Lackawanna N.Y. (25) B2	4.225
Los Angeles Calif. B3	4.475
Milton Pa. B6	4.350
Minneapolis Colo. C16	4.225
New Britain (10) S15	4.225
N. Tonawanda N.Y. B11	4.225
Pittsburg Calif. C11	4.475
Riverdale Ill. A7	4.225
San Francisco S7	5.00
Seattle (25) B3	4.225
Seattle N14	4.75
Sharon Pa. S3	4.225
So. Chicago Ill. W14	4.225
So. San Francisco (25) B3	4.475
Sparrows Point Md. B2	4.225
Sterling Ill. N15	4.225
Torrance Calif. C11	4.475
Warren O. R2	4.225
Weirton W.Va. W6	4.225
West Leechburg Pa. A4	4.375
Youngstown O. Y1	4.225

STRIP, Hot Rolled Alloy

Bridgeport Conn. (10) S15	6.05
Carnegie Pa. S18	6.45
Fontana Calif. K1	7.30
Gary Ind. U5	6.10
Houston Tex. S5	6.50
Kansas City Mo. S5	6.70
Midland Pa. C18	5.85
New Britn Conn. (10) S15	6.05
Sharon Pa. S3	6.45
Youngstown O. Y1	6.10

STRIP, Cold-Rolled Carbon

Anderson Ind. (40) G6	5.50
Bridgeport Conn. (10) S15	5.80
Butler Pa. A10	5.10
Cleveland A7	5.10
Dearborn Mich. D3	6.00
Detroit D2	5.45
Detroit M1	5.45
Dover O. (40) G6	5.50
Beaver Meth. G5	5.30
Follansbee W.Va. F4	5.10
Fontana Calif. K1	6.75
Frankfort Park Ill. (40) T6	5.35
Ind Harbor Ind. I-2	5.35
Lackawanna N.Y. B2	5.10
Los Angeles C1	6.85
Mattapan Mass. T6	5.95
Middletown O. A10	5.10
New Britain (10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea O. (40) G6	7.65	.25	10.20	12.50	
Bridgeport Conn. (10) S15	7.65	.25	10.20	12.50	
Bristol Conn. W1		.55	10.50		
Carnegie Pa. S18	7.65	.25	10.20	12.50	
Cleveland A7	7.30	.25	10.20	12.50	
Dearborn Mich. D3	7.90	.50			
Detroit D2	7.50	.30			
Dover O. G6	7.65	.25	10.20	12.50	
Frankfort Park Ill. T6	7.45	.40	10.35	12.65	
Harrison N.J. C18		.55	10.50	12.80	
Mattapan Mass. T6	7.95	.55	10.50	12.80	
New Britn Conn. (10) S15	7.65	.25	10.20	12.50	
New Castle Pa. B4	7.65	.25	10.20		
New Castle Pa. E5	7.65	.25	10.20	12.50	
New Haven Conn. T2	7.70	.30			
New York W3	7.95	.55	10.50	12.80	
Pawtucket R.I. N8					
Cleveland Base	7.65	.25	10.20	12.50	
Worcester Mass. Base	7.95	.55	10.50	12.80	
Sharon Pa. S3	7.65	.25	10.20	12.50	
Trenton N.J. R5	7.65	.55	10.50	12.80	
Waterford Conn. W2	7.60	.20	10.15	12.65	
Warren O. R2	7.65	.25	10.20	12.50	
Weirton W.Va. W6	7.65	.25	10.20	12.50	
Worcester Mass. A7	7.60	.55	10.50	12.80	
Worcester Mass. T6	7.60	.55	10.50	12.80	
Youngstown O.	7.65	.25	10.20	12.50	

Spring Steel (Tempered)

Trenton N.J. R5 (29)	10.30	12.50	15.35
Harrison N.J. C18	10.30	12.50	15.35
New York W3	10.30*	12.50*	15.35*
Youngstown O.	10.30	12.50	15.35

* Plus $1.375 per 100 lb.

STRIP, Electro Galvanized

Dover O. G6	5.50
Warren O. T5	5.70
Weirton W.Va. W6	5.50
Youngstown O. S.	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport Conn. (10) S15	12.15
Carnegie Pa. S18	12.00
Cleveland A7	11.40
Dover O. G6	11.90
Fontana Calif. K1	13.90
Harrison N.J. C18	12.00
Midland Pa. C18	12.00
New Britn Conn. (10) S15	12.15
Pawtucket R.I. (31) N8	12.15
Pawtucket R.I. (42) N8	12.45
Sharon Pa. S3	12.00
Worcester Mass. A7	11.70
Youngstown O. S.	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland Ky. (48) A10	5.975
Warren O. R2	6.325

STRIP, Cold-Rolled Ingot Iron

Warren O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale Ill. A1	4.30
Sharon Pa. S3	4.55
Youngstown U5	4.15

SPRINGS, Coiled Flat

Bristol Conn. W1	10.50
Detroit D2	10.00
Detroit M1	10.00
Harrison N.J. C18	10.50
Pawtucket R.I. N8	10.50
Waterford Conn. W2	10.50

WIRE, Music

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Cold Rolled Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Oil Tempered Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Valve Spring Quality

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Hard Drawn Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Piano

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Cold Rolled Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Oil Tempered Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Valve Spring Quality

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Hard Drawn Spring

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

WIRE, Piano

Bartonville Ill. R3	14.00
Bristol Conn. W1	14.00
Buffalo R2	14.00
Cleveland A7	14.00
Detroit D2	14.00
Detroit M1	14.00
Harrison N.J. C18	14.00
Pawtucket R.I. N8	14.00
Waterford Conn. W2	14.00

Key to Producers

A1 Acme Steel Co.	C10 Colorado Fuel & Iron	G2 Globe Iron Co.
A2 Alan Wood Steel Co.	C11 Columbia-Geneva Steel	G3 Globe Steel Tubes Co.
A3 Allegheny Ludlum Steel	C12 Columbia Steel & Shaft	G4 Granite City Steel Co.
A4 American Steel & Wire	C13 Columbia Tool Steel Co.	G5 Great Lakes Steel Corp.
A5 American Tinware Steel Co.	C14 Compressed Steel Shaft	G6 Greer Steel Co.
A6 Anchor Post Fence Co.	C15 Connors Steel Co.	H1 Hanna Furnace Corp.
A7 Apollo Steel Co.	C16 Continental Steel Corp.	I-1 Ingot Iron Co.
A8 Armco Steel Corp.	C17 Copperweld Steel Co.	I-2 Inland Steel Co.
A9 Atlantic Steel Co.	C18 Crucible Steel Co.	I-3 Interlake Iron Corp.
A10 Atlas Steel Co.	C19 Cumberland Steel Co.	I-4 Ingersoll Steel Div. Borg-Warner Corp.
A11 Atlantic Steel Co.	C20 Cuyahoga Steel & Wire	I-7 Indiana Steel & Wire Co.
A12 American Cladmetals Co.	C22 Claymont Steel Corp.	J1 Jackson Iron & Steel Co.
B1 Babcock & Wilcox Co.	D2 Detroit Steel Corp.	J3 Jessop Steel Co.
B2 Bethlehem Steel Co.	D3 Detroit Tube & Steel	J4 Jackson Steel & Wire Co.
B3 Beth. Pac. Coast Steel	D4 Disston & Sons, Henry	J5 Jones & Laughlin Steel
B4 Blair Strip Steel Co.	D6 Driver, Harris Co.	J6 Joslyn Mfg. & Supply
B5 Bliss & Laughlin Inc.	D7 Dickson Weatherproof Nail Co.	J7 Judson Steel Corp.
B6 Bourne-Fleet Corp.	E1 Eastern Gas & Fuel Assoc.	J8 Jersey Shore Steel Co.
B8 Braeburn Alloy Steel	E2 Eastern Stainless Steel	K1 Kaiser Steel Corp.
B11 Buffalo Bolt Co.	E4 Electro Metallurgical Co.	K2 Keokuk Electro Metals
B12 Buffalo Steel Div. H.K. Porter Co.	E6 Elliott Bros. Steel Co.	K3 Keystone Drawn Steel
B14 A. M. Byers Co.	E8 Empire Steel Corp.	K4 Keystone Steel & Wire
C1 Castrip Steel Corp.	F2 Firth Sterling Inc.	L1 Laclede Steel Co.
C2 Gauntlet Steel Div. Borg-Warner Corp.	F3 Fitzsimons Steel Co.	L2 LaSalle Steel Co.
C4 Carpenter Steel Co.	F4 Follansbee Steel Corp.	L3 Latrobe Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.	F5 Franklin Steel Div. Borg-Warner Corp.	L5 Lockhart Iron & Steel
C7 Cleve. Cold Rolling Mills	F6 Fretz-Moon Tube Co.	L6 Lone Star Steel Co.
C8 Cold Metal Products Co.	F7 Ft. Howard Steel & Wire	L7 Lukens Steel Co.
C9 Colonial Steel Co.		

WIRE, Merchant Quality

(6 to 8 gage)	Annl'd.	Galv.
Alabama City B2	6.075	6.325
Aliquippa J5	6.075	6.42*
Atlanta A11	6.325	6.675
Bartonsville 1-9 K4	6.075	6.40
Buffalo W12	5.925	
Cleveland A7	6.075	6.225
Crawfordsville Ms	6.175	6.35
Donora Pa A7	6.075	6.225
Duluth Minn A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston Tex S5	6.475	6.625
Johnstown B2	6.075	6.45*
Joliet Ill A7	6.075	6.225
Kansas City Mo S5	6.675	6.825
Kokomo C16	6.175	6.425
Los Angeles B3	7.025	7.40*
Minneapolis C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.925	
Pitts. Calif. C11	7.025	7.175
Pittsmth (1)-P12	6.475	
Rankin A7	6.075	6.225
So Chicago B2	6.075	6.325
So S Fran. C10	7.025	7.40*
Sparrows Pt. B2	6.175	6.55*
Sterling Ill. (1)-N15	6.075	6.425
Struthers O. Y1	6.075	6.475
Torrance Cal. C11	7.025	
Worcester A7	6.375	6.525

*Based on 14-cent zinc.

ROPE WIRE

Alton Ill. L1	9.15
Bartonville Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria O. S1 (43)	8.55
Johnstown Pa. B2 (43)	8.55
Monessen Pa. P16 (43)	8.55
Monessen Pa. P7 (43)	8.50
Muncie Ind. I-7 (43)	8.75
Palmer Mass. W12 (43)	8.55
Portsmouth O. P12 (43)	8.55
Roebling N.J. R5 (43)	8.85
Sparrows Pt. B2 (43)	8.85
Struthers O. Y1 (43)	8.85
Worcester Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

Alabama City Ala. B2	5.225
Aliquippa Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton Ill. L1	5.45
Bartonsville Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7 C20	5.225
Crawfordsville Ind. Ms	5.325
Donora Pa. A7	5.225
Duluth Minn. A7	5.225
Fairfield Ala. T2	5.225
Fostoria O. (24) S1	5.725
Houston S5	5.625
Johnstown Pa. B2	5.225
Joliet Ill. A7	5.225
Kansas City Mo. S5	5.525
Kokomo Ind. C16	5.325
Los Angeles B3	5.475
Minneapolis Colo. C10	5.475
Monessen Pa. P7	5.475
Newark N.J. (24) L1	5.55
No. Tonawanda B11	5.225
Palmer Mass. W12	5.225
Pittsburg Calif. C11	5.475
Portsmouth O. P12	5.625
Rankin Pa. A7	5.225
Sparrows Point Md. B2	5.225
So. San Francisco C10	6.175
Sparrows Point Md. B2	5.325
Sterling Ill. (1)-N15	5.225
Struthers O. Y1	5.225
Torrance Calif. C11	5.475
Worcester A7	5.325

WIRE, Cold-Rolled Flat

Anderson Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfordsville Ind. Ms (43)	5.90
Donora Pa. P16 (43)	6.35
Monessen Pa. P16 (43)	6.35
Monessen Pa. P7 (43)	6.30
Parkt. R.I. (12)-Ns (43)	6.85
Trenton N.J. R5 (43)	6.15
Worcester Mass. A7 (43)	6.15
Worcester Mass. T6 (43)	6.50
Worcester Mass. W12 (43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville Ill. K4	8.90
Monessen Pa. P16 (43)	8.50
Muncie Ind. I-7 (43)	8.70
Roebling N.J. R5 (43)	8.80
Sparrows Pt. Md. B2 (43)	8.60
Johnstown Pa. B2 (43)	8.50

WIRE (16 gage)

	Annl'd. Stone	Galv. Stone
(Add 1.7 on base and extras)		
Aliquippa J5	10.15	12.15
Bartonsville 1-9 K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfordsville Ms	10.25	12.00
Fostoria O. S1 (43)	10.75	12.00
Johnstown B2	10.75	12.50‡
Kokomo C16	10.625	12.325*
Minneapolis C10	10.40	12.425*
Palmer Mass W12	10.25	12.15
Pitts. Cal. C11	10.60	11.90
Portsmouth O. P12 (44)	10.84	12.684
Waukegan A7	10.25	11.50
Worcester A7	10.25	11.85

*Based on 14-cent. $14.50-cent zinc. ‡Includes 4.7% increase.

WIRE, MB Spring, High Carbon

Aliquippa Pa. J5 (42)	6.25
Alton Ill. L1	6.85
Bartonsville Ill. K4	6.65
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora Pa. A7 (43)	6.25
Duluth Minn. A7 (43)	6.25
Fostoria O. S1 (43)	6.25
Johnstown Pa. B2 (43)	6.25
Millburn (42) No (43)	7.65
Minneapolis Colo. C10 (43)	6.50
Monessen Pa. P7 (43)	6.25
Monessen Pa. P16	6.75
Muncie Ind. I-7 (43)	6.45
Palmer Mass. W12 (43)	6.55
Pittsburg Calif. C11 (43)	7.20
Roebling N.J. R5 (43)	6.55
Portsmouth O. P12 (43)	6.25
So. Chicago Ill. B2 (43)	6.25
So. San Fran. C10 (43)	7.20
Sparrows Pt. Md. B2 (43)	6.55
Struthers O. Y1 (43)	6.25
Trenton N.J. A7 (43)	6.55
Waukegan Ill. A7 (43)	6.25
Worcester A7 T6 (43)	6.55
Worcester Mass. W12 (43)	6.55

WIRE, Tire Bead

Bartonville Ill. K4	11.51
Monessen Pa. P16 (43)	11.40
Roebling N.J. R5 (43)	11.55

WIRE, Fine & Weaving (8 Coils)

Bartonville Ill. K4	9.42
Buffalo W12 (43)	9.00
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawfordsville Ind. Ms (43)	8.90
Fostoria O. S1 (43)	8.90
Johnstown Pa. B2 (43)	8.90
Kokomo Ind. C16 (43)	8.90
Monessen Pa. P16 (43)	8.90
Muncie Ind. I-7 (43)	9.10
Palmer Mass. W12 (43)	9.20
Roebling N.J. R5 (43)	9.20
Waukegan Ill. A7 (43)	8.90
Worcester Mass. A7 T6 (43)	9.20

WIRE, Barbed

	Col.
Alabama City Ala. B2	144
Aliquippa Pa. J5	147*
Atlanta A11	149
Bartonsville Ill. (19)-K4	146
Crawfordsville Ind. Ms	149
Donora Pa. A7	142
Duluth Minn. A7	142
Fairfield Ala. T2	142
Houston Tex. S5	150
Johnstown Pa. B2	142
Joliet Ill. A7	142
Kansas City Mo. S5	154
Kokomo Ind. C16	149
Minneapolis Colo. C10	150‡
Monessen Pa. P7	142
Pittsburg Calif. C11	162
Rankin Pa. A7	142
So. Chicago Ill. B2	144
So. San Fran. Calif. C10	167*
Sparrows Point Md. B2	148
Sterling Ill. (1) N15	146

*Based on 14-cent zinc.

WIRE, Upholstery Spring

Aliquippa Pa. J5	6.275
Alton Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora Pa. A7	6.275
Duluth Minn. A7	6.275
Johnstown Pa. B2	6.275
Los Angeles B3	7.225
Minneapolis Colo. C10	6.525
Monessen Pa. P7	6.275
Monessen Pa. P16 (42)	6.40
New Haven Conn. A7	6.575
Palmer Mass. W12	6.275
Pittsburg Calif. C11	7.225
Portsmouth O. P12	6.275
Roebling N.J. R5	6.575
So. Chicago Ill. B2	6.275
So. San Francisco C10	7.225
Sparrows Point Md. B2	6.375
Torrance Calif. C11	7.225
Trenton N.J. A7	6.575
Waukegan Ill. A7	6.275
Worcester Mass. A7	6.575

WOVEN FENCE 9-15½ Ga.

	Col.
Alabama City Ala. B2	135
Ala City Ala. (12)-Sks B2	122
Aliquippa Pa 9-14 ga. J5	131
Atlanta A11	140
Bartonsville Ill. (19) K4	137
Crawfordsville Ind. Ms	140
Donora Pa. A7	133
Duluth Minn. A7	133
Fairfield Ala. T2	133
Houston Tex. S5	141
Johnstown Pa. B2	138
Johnstown 12-ga. S* B2	229
Joliet Ill. A7	133
Kansas City Mo. S5	145
Kokomo Ind. C16	140
Minneapolis Colo. C10	146*
Monessen Pa. P7	138
Pittsburg Calif. C11	156
Rankin Pa. A7	133
So. Chicago Ill. B2	135
Sterling Ill. (1) N15	137

*Based on 14-cent zinc.

BALE TIES, Single Loop

	Col.
Alabama City Ala. B2	132
Atlanta A11	135
Bartonsville Ill. (19) K4	132
Crawfordsville Ind. Ms	134
Donora Pa. A7	132
Duluth Minn. A7	132
Fairfield Ala. T2	132
Joliet Ill. A7	132
Kansas City Mo. S5	144
Kokomo Ind. C16	134
Minneapolis Colo. C10	137
Pittsburg Calif. C11	156
So. Chicago Ill. B2	132
So. San Fran. Calif. C10	134
Sparrows Point Md. B2	134
Sterling Ill. (1) N15	132

FENCE POSTS

Chicago Hts. Ill. C2	140
Duluth Minn. A7	133
Franklin Pa. F5	140
Huntington W. Va. W7	148
Johnstown Pa. B2	148
Joliet Ill. A7	140
Kokomo Ind. C16	139
Minneapolis Colo. C10	158
Monessen Pa. P7	138
Moline Ill. B2	140
So. Chicago Ill. B2	140
Tonawanda N.Y. B12	148
Williamsport Pa. S19	158

TRACK BOLTS (20) Treated

Kansas City, Mo. S5	9.85
Lebanon Pa. (31) B2	9.85
Minneapolis Colo. C10	9.85
Pittsburgh, Pa. P14	9.85

AXLES

Ind. Harbor, Ind. S13	5.65
Johnstown Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala. B2 (44)	118
Aliquippa Pa. J5 (44)	118
Atlanta A11	130
Bartonsville, Ill. (19) K4	127
Chicago, Ill. W13 (44)	118
Cleveland A9 (44)	127
Crawfordsville Ind. Ms	130
Donora, Pa. A7 (44)	118
Duluth, Minn. A7 (44)	118
Fairfield Ala. T2 (44)	118
Galveston, Tex. T7 (44)	126
Houston, Tex. S5 (44)	126
Johnstown, Pa. B2 (44)	118
Joliet, Ill. A7 (44)	118
Kansas City, Mo. S5 (44)	130
Kokomo, Ind. C16	129
Minneapolis, Colo. C10 (44)	123
Monessen, Pa. P7	127
Pittsburg, Calif. C11 (44)	137

RAILS	Std. No. 1	Std. No. 2	Tee Rails All No. 2	60 lb. Under
Bessemer Pa. U5	3.775	3.675	3.725	4.25
Ensley, Ala. T2	3.775	3.675		4.25
Fairfield, Ala. T2				4.25
Gary, Ind. U5	3.775	3.675	3.725	
Huntington, W. Va. W7				4.29
Indiana Harbor, Ind. I-2	3.775	3.675	3.725	
Johnstown, Pa. B2				4.16-4.25
Lackawanna, N.Y. B2	3.775	3.675		4.25
Minneapolis, Colo. C10	$75.50‡	$73.50‡		4.75
Steelton, Pa. B2	3.775	3.675		
Williamsport, Pa. S19				5.00

* Per net ton.

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa. A3	$7.80
Wheeling, W. Va. W10	7.80

TIE PLATES

Fairfield, Ala. T2	4.775
Gary, Ind. U5	4.775
Ind. Harbor, Ind. I-2	4.775
Lackawanna, N.Y. B2	4.775
Minneapolis, Colo. C10	$95.50*
Pittsburg, Calif. C11	4.925
Seattle B3	4.925
Steelton, Pa. B2	4.775
Torrance, Calif. C11	4.925

* Per net ton.

JOINT BARS

Bessemer, Pa. U5	4.925
Fairfield, Ala. T2	4.925
Ind. Harbor, Ind. I-2	4.925
Joliet, Ill. U5	4.925
Lackawanna, N.Y. B2	4.925
Minneapolis, Colo. C10	4.925
Steelton, Pa. B2	4.925

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1	6.65
Kansas City, Mo. S5	6.90
Lebanon, Pa. B2	6.65
Minneapolis, Colo. C10	6.65
Pittsburgh, Pa. J5	6.65
Seattle B3	7.15
So. Chicago, Ill. B2	6.65
Struthers, O. Y1	6.65
Youngstown, O. R2	6.65

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala. B2 (44)	118
Atlanta A11	129
Bartonsville, Ill. (19) K4	126
Chicago W13	127
Crawfordsville, Ind. Ms	128
Donora, Pa. A7 (45)	118
Duluth, Minn. A7 (45)	118
Fairfield, Ala. T2 (45)	118
Johnstown, Pa. B2 (45)	118
Joliet, Ill. A7 (45)	118
Kokomo, Ind. C16	128
Minneapolis, Colo. C10 (45)	123
Monessen, Pa. P7	127
Pittsburg, Calif. C11 (45)	137
Portsmouth, O. P12	132
Rankin, Pa. A7 (45)	118
Sparrows Point, Md. B2 (45)	120
Sterling, Ill. (1) N15 (45)	118
Torrance, Calif. C11 (45)	138
Worcester, Mass. A7 (45)	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa. A3	$7.80
Wheeling, W. Va. W10	7.80

TIE PLATES

Fairfield, Ala. T2	4.775
Gary, Ind. U5	4.775
Ind. Harbor, Ind. I-2	4.775
Lackawanna, N.Y. B2	4.775
Minneapolis, Colo. C10	$95.50*
Pittsburg, Calif. C11	4.925
Seattle B3	4.925
Steelton, Pa. B2	4.775
Torrance, Calif. C11	4.925

* Per net ton.

JOINT BARS

Bessemer, Pa. U5	4.925
Fairfield, Ala. T2	4.925
Ind. Harbor, Ind. I-2	4.925
Joliet, Ill. U5	4.925
Lackawanna, N.Y. B2	4.925
Minneapolis, Colo. C10	4.925
Steelton, Pa. B2	4.925

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1	6.65
Kansas City, Mo. S5	6.90
Lebanon, Pa. B2	6.65
Minneapolis, Colo. C10	6.65
Pittsburgh, Pa. J5	6.65
Seattle B3	7.15
So. Chicago, Ill. B2	6.65
Struthers, O. Y1	6.65
Youngstown, O. R2	6.65

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.500
Shear, Cold Work	0.550
Hi Carbon-Cr	0.655

Grade by Analysis

W	Cr	V	Co	
18	4	1		3.595
18	4	2		3.65-3.66
20-25	4	2	12-25	3.555-3.675
18	4	2	5	2.460
18-25	4	2-5	1-4.75	2.125
18	4	2	9	2.445-2.46
13.5	4	3		1.6025
1	1.25	0.5		1.01

W	Cr	V	Mo	
6.4	4.4	1.9		0.96-0.965
6	4	3	5	1.100
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, T4, V2 and V3.

Footnotes

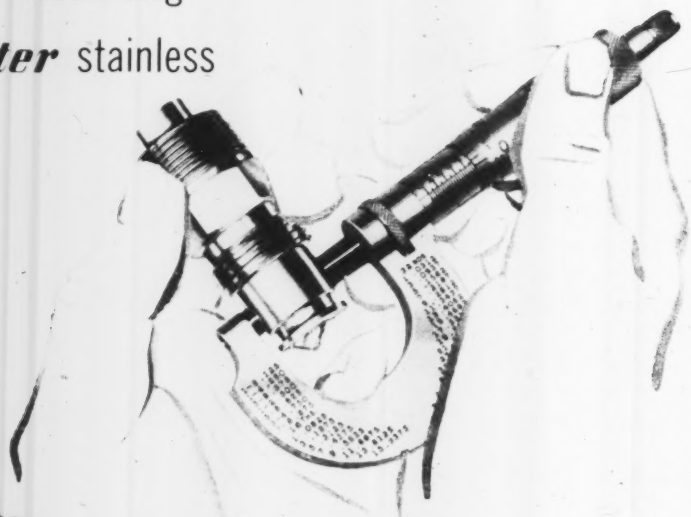
(2) Chicago base.
(12) Angles, flats, bands.
(13) Merchant.
(16) Reinforcing.
(19) Garden or Barb, base.
(23) To jobbers, 5 cars, lower.
(28) 16 gage and heavier.
(29) 6 in. and narrower.
(30) Pittsburgh base.
(32) Cleveland & Pitts. base.
(42) Worcester, Mass. base.
(43) Add 0.10c for 12 Ga. & heavier.
(44) 9" and lighter.
(45) 8" and lighter.
(46) Flats only.
(48) To dealers.
(49) Chicago & Pitts. base.
(50) 0.25c off for untreated.
(51) New Haven, Conn., base.
(52) Del. San Francisco Bay base.

(21) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 16 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators, to consumers, 5.85c.
(27) Bar mill sizes.
(28) Barbed coil.
(29) Add $11.50 per ton.
(30) Shipped add 0.25c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 22" and narrower.
(36) 24" and narrower.
(37) 1 gage & lighter, 60" & narrower.
(38) 14 gage & lighter, 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035", 0.025" and heavier 0.25c higher.
(41) 4.10c for cut lengths.
(42) Plus 0.35c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Manufacturing Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N4 Nelson Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Nies Rolling Mill Div.
N14 Nettwest Steel Rod Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Shore-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works.
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

You get a far higher number of **good ones** on each run when machining *Carpenter* stainless



Rejects on this needle valve part dropped 31%, when the company changed to Carpenter No. 8, Type 303.

Plant records prove it: a big majority of the troubles in machining stainless parts just aren't necessary! That's why we'd like to show you what can happen when you change from a run-of-the-mill free-machining stainless to a Carpenter Free-Machining grade. Records prove that on many jobs, rejects take a nosedive, tool life goes up, and costs down. That's because Carpenter Stainless is made in a specialty tool steel mill to highest tool steel quality standards. The same careful controls are applied to make sure every bar of Carpenter Stainless will work the same. It stands to reason that with Stainless like this you can get more good parts out of the lot. Isn't it worth a try? Just specify "Carpenter" on your next production order. The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.

Export Department: The Carpenter Steel Co., Port Washington, N. Y. — "CARSTEELCO"

Carpenter **Free-Machining Stainless**

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c			
Pounds Per Ft	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.62			

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Alton, Ill., Ed	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va., W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Elmira, Pa., N2	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Fontana, Calif., K1	21	1.75	24	5.70	26.5	9.25	27	10	27.5	10	28	10.5	28.5	10.25	28.5	10.25
Ind. Harbor, Ind., Y1	31.5	12.25	34.5	16.25	37	19.75	37.5	19.5	38	20.5	38.5	21	39	20.75	39	20.75
Lorain, O., N8	32.5	14.25	35.5	18.25	38	21.75	38.5	21.25	39	22.25	39.5	22.75	40	22.25	40	22.25
Pittsburgh, J5	30.75		33.75		36.25		36.75		37.25		37.75		41.5		41.5	
Sharon, Pa., M6	32.5	13.25	35.5	17.25	38	20.25	38.5	19.75	39	20.25	39.5	20.75	40	20.25	40	20.25
Sparrows Pt., Md., B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown, R2	32.5	14.25	35.5	18.25	38	21.75	38.5	21.25	39	21.25	39.5	22.75	40	22.25	40	22.25
Youngstown, Y1	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Wheatland, Pa., W9	32.5	13.25	35.5	18.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size-Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
List Per Ft.	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
Pounds Per Ft.	0.85	0.52	1.02	1.47	2.01	2.72	3.64	5.82	7.66	9.00	10.25	11.54	14.81	18.18

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa., J5	24	6	27	+.25	27	+.25	29	10.25	29	10.25	33.75	15	33.75	15		
Ambridge, Pa., N2	24	6	27	+.25	27	+.25	29	10.25	29	10.25	33.75	15	33.75	15		
Lorain, O., N8	24	6.75	27	+.75	27	+.75	29	10.75	29	10.75	33.75	15.5	33.75	15.5		
Youngstown, Y1	24	6	27	+.25	27	+.25	29	10.25	29	10.25	33.75	15	33.75	15		

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2	24	6.75	27	+.75	27	+.75	29	10.75	29	10.75	33.75	15.5	33.75	15.5		

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2
List Per Ft	5.5c	8c	9c	12c	17c	23c	27.5c	37c	$1.09
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28	2.73	3.68

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va., W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25						
Butler, Pa., F6	30.5	1.25	25	+1.75	20	+5.5										
Elmira, Pa., N2	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25						
Sharon, Pa., M6	29.5	+0.25	23	+1.25	18	+5.25										
Sparrows Pt., Md., B2	28.5	+0.75	23	+3.75	18	+7.50										
Youngstown, R2							33	14.75	33	14.75						
Wheatland, Pa., W9	28.5	+0.75	23	+3.75	18	+7.50										

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill, minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec Weld— H.R.	Elec Weld— C.D.
1	13	14.19	16.71 17.77	16.20	16.20
1¼	13	16.97	19.80 21.26	19.16	19.16
1½	13	18.22 18.77	22.08 22.82	18.19	21.41
1¾	13	20.35 21.35	24.92 25.49	20.69	24.35
2	13	22.81 23.93	27.94 28.58	23.19	27.28
2¼	13	23.69 26.66	31.38 32.18	25.84	30.42
2½	12	28.40 29.36	34.55 35.58	28.46	33.50
2¾	12	31.28 32.17	37.83 39.19	31.19	36.67
2½	12	33.87 34.82	40.96 42.44	33.65	38.86
3	12	35.78 36.87	42.11 44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.	23
Lag screws, over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P.	Reg. Hvy.
Square:	
½-in. & smaller	15 15
⅝-in. & ⅞-in.	12 6.5
1-in.-1½-in.	6 1
1⅝-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅞-in.	16.5 6.5
1-in.-1½-in.	12 2
1⅝-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅞-in.	23 17.5
1-in. & 1½-in.	19.5 12
1⅝-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case of keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅞-in.	29.5	22
1-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
½-in. & smaller	35	
⅝-in. to ⅞-in.	28.5	
1-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged, per cent off list)

6 in. or shorter:

⅜-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
⅜-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in. larger 7.50c

½-in. under 36 off

ELECTRODES

(Threaded, with nipples, in boxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17 18 20	60 72	17.85
8 to 16	48 60 72	17.85
7	48 60	19.37
6	48 60	20.95

CARBON

35 40	110	8.03
30	65 84 110	8.03
24	72 to 104	8.03
17 to 20	34 90	8.03

METALLURGICAL COKE

f.o.b. net ton

BEEHIVE OVENS

Connellsville fur.	$14.50-15.00
Connellsville fdy.	16.00-17.50
New River foundry	20.50
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass. ovens:	
New England, del.	*24.50
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Detroit, del.	27.05
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati, del.	25.23
LoneStar Tex., ovens	18.50
Philadelphia, ovens	22.70
Nevillelsland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens:	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens:	24.00
Detroit, del.	25.00
Buffalo, del.	26.58
Flint, del.	26.73
Pontiac, del.	25.56
Saginaw, del.	27.08

*Or within $4.55 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens	18.50
Pure benzol	36.00-45.00
Toluol, one deg.	26.00-33.00
Industrial xylol	25.00-33.50

Per ton bulk ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) 17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in lit., Ky., net tons, carloads, effective CaF$_2$ content 70%, $43.60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers. List to list-plus-$1

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	50.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait, Types 301-347 and 430 sheets, except 303 and 309: B2

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347

Bridgeville, Pa., bars, wire, sheets & strip I4

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502: A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18

Cleveland, strip A7

Detroit, strip M1 quotes 34.00c on Type 301, 36.50c; 302, 38.50c; 304, 38.50c; 316, 52.00c; 347, 30.50c; 410, 31.00c; 430

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347

Duquesne, Pa., bars U5

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347

Gary, Ind., sheets except Type 416 U5

Harrison, N. J., strip and wire C18

Massillon, O., all items R2

McKeesport, Pa., strip Type 410, bars & wire, Types 410 through 430 and 31 25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2

McKeesport, Pa., bars, sheets except Type 416 U5

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10

Midland, sheets & strip C18

Munhall, Pa., bars U5

Muncie, Ind., wire 1-7 quotes types 302, 304, 430

Pittsburgh, sheets C18

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3

So. Chicago, Ill., bars & structurals U5

Syracuse, N. Y., bars, wire & structurals C18

Trussville, Pa., bars U4

Wallingford, Conn., strip W2 quotes 0.25c higher

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347

Waukegan, bars & wire A7

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8

METAL POWDERS

(Per pound, f.o.b. shipping point in 500 lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed 99+% Fe	36.50
Unannealed, 99+% Fe minus 325 mesh	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-98.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel, unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh; 1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9% minus 200 mesh	3.24
Chromium, electrolytic 99% Cr, min.	3.50

Hello, Young Voters!

You've taken this country as your birthplace.

You toddled around and laughed and grew under the sunshine skies of Liberty.

Your fathers and mothers put you to bed each night with the confidence of Freedom, not in furtive fear.

You learned in free schools.

You played ball or skated or jumped rope without a care in the world.

Your stomach was full, your clothes were warm, your roof was sound.

You enjoyed privileges and pleasures, movies and cars, treats and trips like no other youth growing up in the world ever did before.

Now you're of age.

You're full-fledged citizens.

Now it's your turn to pay with a little of your time and some of your thought for a lot of things you received when you were growing up.

The least you can do is to vote to help keep your country the way you want it, lest the children *you're* raising won't have the frank, free years you have had.

Be sure, Young Voters, you're registered!
Be sure, Young Voters, you vote!

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H R 18 Ga Heavier*	C R	Gal 10 Ga †	H R *	C R *	H R Rds	C F Rds	H R Alloy 4140††		Carbon	Floor
New York (city)	6.56	7.57	8.77	6.86		6.89	7.81‡	11.24	6.69	6.96	8.31
Jersey City (city)	6.35	7.27	8.47	6.75	—	6.59	7.53	9.54	6.39	6.66	8.01
Boston (city)	6.71	7.56	8.74	6.75		6.62	7.69‡	10.80‡	6.76	6.93	8.18
Boston (w hse)	6.51	7.36	8.54	6.55		6.42	7.49‡	10.60‡	6.56	6.75	7.98
Phila (city)	6.36	7.38	8.60	6.70	8.55	6.67	7.70‡	11.04	6.42	6.49	7.62
Phila (city)	6.16	7.13	8.35	6.45	8.30	6.42	7.45‡	10.75‡	6.17	6.24	7.36
Balt (city)	6.01	7.17	8.62	6.62		6.61	7.62‡	11.37	6.67	6.67	7.90
Balt (county)	5.81	7.17	8.42	6.42		6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va	7.60 ≈					6.44	8.45		7.25	6.64	7.33
Richmond, Va	6.14	6.96	8.68	8.53		6.30	7.38		6.58	6.68	7.80
Wash (w hse)	6.41	7.61	8.90	6.89		6.90	7.78		6.93	6.93	8.17
Buffalo (dely)	6.00	6.85	8.06	6.41		6.10‡	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w hse)	5.80	6.65	8.46	6.21		5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts (w hse)	5.80	6.65	8.05	5.94		5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (w hse)	6.07	6.92	8.34	6.13	7.70-8.03	6.30	7.10‡	10.92	6.42	6.47	7.52
Cleveland (dely)	6.00	6.85	8.20	6.20		6.09	7.11‡	10.99	6.48	6.32	7.71
Cleve (w hse)	5.80	6.65	8.19	6.00		5.89	6.91‡	10.79	6.28	6.12	7.51
Cincin (city)	6.28	6.87	8.67	6.36		6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.25	6.03 ≈		6.03	7.06‡	10.85	6.13	6.13	7.28
Chicago (w hse)	5.80	6.65	8.05	5.83		5.83	6.86‡	10.65	5.93	5.93	7.18
Milwau (city)	6.17	7.02	8.22	6.20		6.20	7.27‡	11.02	6.32	6.32	7.53
Milwau (county)	5.97	6.82	7.02	6.00		6.00	7.07‡	11.82	6.12	6.12	7.33
St Louis (dely)	6.30	7.15	8.55	6.34		6.33	7.40‡	11.15‡	6.53	6.55	7.78
St L (w hse)	6.10	6.95	8.35	6.14		6.13	7.20‡	10.95	6.33	6.35	7.58
Birm bm (city)	5.95	6.80	7.85‡	5.95		5.95	8.40		6.10	6.25	8.63
Birm bm (w hse)	5.80	6.65	7.70‡	5.80		5.80	8.40		5.95	6.10	8.48
Los Ang (city)	6.80	8.65	10.00	6.94	11.40	6.80	8.81	12.25	6.80	6.86	9.67
L A (w hse)	6.60	8.45	9.80	6.74	11.20	6.60	8.61	12.05	6.60	6.66	9.47
Seattle Tacoma	7.30	8.22	10.00	7.30		7.30	9.62‡	10.90‡	6.95	7.10	9.12
SanFran (w hse)	6.80	8.22	9.70	6.79		6.79	8.65‡	11.85	6.70	6.85	9.20

*Prices do not include gage extras. † Prices include gage and coating extras, except Birmingham coating extra excluded; and Los Angeles (gage extra excluded). ‡ Includes 25-cent special bar quality extra. § as rolled. †† as annealed. Base quantities: 2000 to 9999 lb except as noted. Cold-rolled strip: 2000 lb and over; cold-finished bars, 2000 lb and over. ≈ 500 to 1499 lb. ‡ 450 to 1499 lb. ¶ 1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.20
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 36-62% concentrates, contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68% Fe, spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48%, nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Domestic
(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, 22.50c per lb of contained Cr, c.l. packed 22.65c, ton lot 23.80c, less ton lot 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr, 67-72%.) Contract, carload, lump, bulk, max. 0.03% C (4.60c per lb of contained Cr; 0.04% C 31.30c; 0.06% C 30.50c; 0.10% C 30.00c; 0.15% C 29.75c; 0.20% C 29.50c; 0.50% C 29.25c; 1% C 29.00c; 1.50% C 28.85c; 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%.) Contract, c.l. x M x D, bulk, 23.25c per lb of contained Cr, C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, x M x D, 16.35c per lb of alloy, ton lot 17.25c, less ton lot 18.4c, delivered, spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon, 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-30%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe.) Contract carload, 1" x D, packed, max 0.50% C grade, $1.08 per lb of contained chromium, ton lot $1.10, less ton $1.12. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.15c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe.) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 2000 to 4999 lb 11.65c, smaller lots 12.15c.

SILICON ALLOYS—*NOTE*

Current prices on manganese, titanium and "other ferroalloys" appeared on page 151 Oct. 20 issue; calcium, zirconium, briquetted alloys and refractories, page 353, Oct. 13.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max): $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max): $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%.) Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%.) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y.; freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80% W, 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; less than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

* Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y. basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Oct. 23	$43.00
Oct. 16	43.00
Sept., 1952	43.00
Oct., 1951	43.60
Oct. 1947	39.85

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling outline and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Indus- trial	No. 1 Heavy Melt Rail- road
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	41.00	43.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O H and Blast Furnace Grades	
2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	$1.00
4 No. 2 Heavy Melting	1.00
5 No. 2 Bundles	1.00
6 Machine Shop Turnings	10.00
7 Mixed Borings and Short Turnings	6.00
8 Shoveling Turnings	6.00
9 No. 2 Bushelling	4.00
10 Cast Iron Borings	6.00
Elec. Furnace and Fdry. Grades	
11 Billet, Bloom & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16 3 feet and under	+ 3.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Alloy Free Turnings	3.00
24 Heavy Turnings	3.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	— 3.00
27 No. 2 Chemical Borings	— 4.00
28 Wrought Iron	+ 10.00
29 Shafting	+ 10.00
31 Odd Ties & Terne Plated Bundles	10.00
Unprepared Grades	
When compressed constitutes:	
32 No. 1 Bundles	6.00
33 No. 2 Bundles	3.00
34 Other than material suitable for hydraulic compression	8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces of foundries, or in basic O-H or blast furnace under NPA allocation of OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5 No. 1 Bushelling	— 3.50
6 No. 1 Turnings	— 3.00
7 No. 2 Turnings, Drillings & Borings	— 12.00
8 No. 2 Cast Steel and uncut wheelcenters	— 6.00
9 Uncut Frogs, Switches	Base
10 Flues, Tubes & Pipes	— 8.00
11 Structural Wrought Iron and/or steel, uncut	— 6.00
12 Destroyed Steel Cars	— 8.00
13 No. 1 Sheet Scrap	— 9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Rerolling Rails	+ 7.00
Cut Rails	
16 3 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 3.00
20 Uncut Tires	+ 2.00
21 Cut Tires	+ 5.00
Bolsters & Side Frames, Uncut	Base
Cut	+ 3.00
24 Angles, Splice Bars & Tie Plates	+ 5.00
25 Solid Steel Axles	+ 12.00
26 Steel Wheels, No. 3 oversize	Base
27 Steel Wheels, No. 3	+ 5.00
28 Spring Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Fireboxes	8.00
32 Boilers	— 6.00
33 No. 2 Sheet Scrap	— 13.00
34 Carsides, Doors, Car Ends, cut apart	— 6.00
35 Unassorted Iron & Steel	— 6.00
36 Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 29, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1 No. 1 (Cupola)	$49.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham
(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago
(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings, turnings	35.00-37.50
Shoveling turnings	37.50
Cast iron borings	35.00-37.50
No. 1 cupola cast	47.00-49.00
Charging box cast	43.00-45.00
Heavy breakable	41.00-43.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	44.00-46.00
Clean auto cast	50.00-52.00
Unstripped motor blocks	35.00-37.00
Malleable	50.00-52.00
Drop broken machinery	50.00-52.00

Cleveland
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings*	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit
(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00†
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-42.00
Drop broken machinery	48.00-49.00
Charging box cast	44.00-45.00

† Nominal.

Los Angeles
(Delivered)

No. 2 bundles	29.00
No. 1 cupola cast	49.00

New York
(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed boring, turnings	29.99
Machine shop turnings	25.99
Cupola cast	42.00-43.00
Unstripped motor blocks	36.00-37.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 bushelling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	48.00-50.00††
Unstripped motor blocks	42.00‡
Heavy breakable	45.00†
Machinery cast	52.00†
Charging box cast	47.00†

†Ceiling price. ‡Nominal.
§Shipping point. ††Delivered.

Pittsburgh
(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

†Ceiling price.

San Francisco
(Delivered)

No. 2 heavy melting	31.00
Machine shop turnings	17.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis
(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	38.00

Youngstown
(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Bushelling	30.00
Bushelling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

†F.o.b., shipping point.

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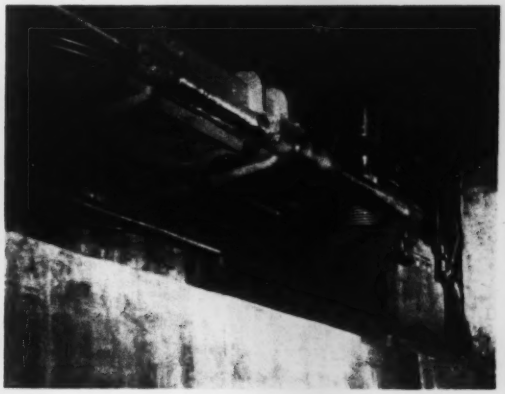

Fading "Rose" at K-F Gains New Life

Kaiser-Frazer Corp., Willow Run, Mich., combines the old with the new in its production of Fairchild C-119 cargo planes. The new, of course, is the "Flying Boxcar," as the planes are known. The old is the compass rose, a nonferrous turntable constructed during World War II to aid in setting compasses on the B-24 Liberator bombers. It's being used again as a crew compensates the magnetic compass, master direction indicator and automatic radio compass of the C-119, left, in an hour. The turning mechanism, right, is entirely nonferrous and, thus, nonmagnetic

Metal suppliers act like the days of plenty are here. Their salesmen want to get a foot in the door, despite pessimistic reports from Washington on supplies

CHEWING UP metals at a record rate, industry finds things are looking up supplywise, despite pessimistic reports from Washington on uneasy supplies and meager allotments.

Metal suppliers, too, won't listen to gloom gathering and certainly act like the days of plenty are here. At the Metal Show in Philadelphia last week there were no indications of a seller's market existing. Even if they can't sell their products freely yet, salesmen want to get their foot in the door early.

What's Ahead — Controls over scarce materials may end sooner than has been thought, says Commerce Secretary Charles Sawyer. The country is catching up with combined defense and civilian needs quickly. This isn't true in all metals though. Manly Fleischmann, ex-DPA head, last week warned that buying and stockpiling of nickel, tungsten, columbium and cobalt must be speeded up if the country wants to be prepared to build weapons quickly in event of an early war.

Perhaps the second quarter will bring balance in copper and aluminum. Lead and zinc are both overly plentiful, and lead dropped to 13.5 cents a pound last week. Tin buyers can get just about all they want, but shy away from the present price.

No Change—Initial allotments of aluminum for civilian-type products will stay at the fourth-quarter level, 55 per cent of pre-Korea use. Added to that, though, are carryovers from the fourth quarter. Current estimates indicate a possible carryover of 72,500 tons if the power shortage continues through November. The aluminum industry can handle a backlog of about 85,000 tons, says aluminum czar Samuel Anderson.

Continuation of the power losses—500 tons daily—may determine whether supplemental allotments will be issued. Repayment of aluminum borrowed from Britain and resumption of stockpiling will be put off until spring.

Defense Electric Power Administration may be forced to curtail production by holders of firm power contracts; a mid-November decision is scheduled. Magnesium output, too, has suffered from power cutbacks, to the tune of about 10 per cent.

Catch in Copper—Though copper allotments for first quarter also stayed at the fourth quarter mark of 50 per cent of pre-Korean use, NPA acknowledges that perhaps its estimates of available metal were a bit optimistic. Before supplementary allotments can be issued the question of replacing borrowed stockpile metal must be answered.

If the present mess in prices, scrap return and allocation discrepancies are cleared up, copper will be allocated a month in advance to enable better planning by mills and foundries. Shipments of fabricated copper products in September, 122,943 tons, were highest since last January. Some November tickets for domestic copper won't find homes because of overestimated supply, strikes and repairs to smelters.

Aluminum Huddle

DPA's Deputy Administrator for Aluminum, Samuel Anderson, is huddling with several companies interested in participating in the 200,000-ton aluminum expansion program. Speculation about companies still in the running centers around Olin Industries, Spartan Aircraft, Schenley Liquors and Kennecott Copper Corp. Another suspect is Wheland Co., a Chattanooga saw mill machinery maker backed by aluminum users in the TVA area. Spartan and Schenley appear to have lost interest in the deal, and Kennecott says it has never been as eager to get in the running as most reports would make it appear.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c delivered.

Brass Ingots: 85-5-5-5 (No. 115): 27.25c; 88-10-2 (No. 215): 40.00c; 80-10-10 (No. 305): 33.00c; No. 1 yellow (No. 405): 23.25c.

Zinc: Prime western 12.00c; brass special (No. 1 intermediate) 13.25c; East St. Louis, 0.2c grade 11.85c, delivered.

Lead: Common 12.10c, chemical 13.10c, corroding 13.40c, St. Louis.

Primary Aluminum: 99% plus ingots 20.00c; pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades (notch bars granulated or shot, grade 1, 18.50c, grade 2, 18.60c; grade 3, 19.40c, grade 4, 18.20c).

Magnesium: Commercially pure (99.8% + standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.8% and over but not meeting specifications below 29.00c; 99.8% and over, arsenic 0.05% max., other impurities 0.1% max., 29.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes **at refinery,** unpacked, 56.50c; 25-lb pigs, 59.15c; XX nickel shot, 60.15c. F.o.b. nickel shot or ingots, 5¢ addition to cast iron, 56.00c. Prices include import duty.

Mercury: Open market, spot, New York, $190-$200 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms, $2.00 del; special or patented shapes $2.15.

Cobalt: 97.99% $2.40 per lb for 500 lb or keg; $2.42 per lb for 100 lb or case; $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$91 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge, 99%): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 43.52; yellow brass 40.17; commercial bronze 95% 44.15; 90% 44.58; red brass 85% 43.10; 80% 42.34; best quality 41.35; nickel silver, 10% 55.05; phosphor-bronze grade A, 5% 64.24.

Rod: Copper, hot-rolled 41.37, cold-drawn 42.62; yellow brass free cutting 34.85; commercial bronze 95% 44.84, 90% 44.07; red brass 85% 42.79, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze 90% 47.04; red brass 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze 95% 45.44, 90% 44.67; red brass 85% 43.39, 80% 42.63; best quality brass 41.64.

(Base prices effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, lots 1000 lb, 32.70c; 500 lb, lots 32.92; l.c.l. 33.42. Weatherproof, 1,000 lb, 33.60; 30,000 lb, 33.85; l.c.l. 34.35. Magnet wire del., 15,000 lb or more 38.75; l.c.l. 39.50.

ALUMINUM

(20,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths of Diameters, In.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.6	.....	.....
0.135-0.096	12-48	32.1	.....	.....
0.095-0.077	12-48	32.5	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Rounds R317-T4		Hexagonal	
	17S-T4	R-317-T4	17S-T4	
0.125	54.6	.....	.....	
0.156-0.0188	46.2	.....	.....	
0.219-0.313	43.6	.....	.....	
0.375	42.0	48.3	50.4	
0.406	42.0	.....	.....	
0.438	42.0	48.3	50.4	
0.469	42.0	.....	.....	
0.500	42.0	48.3	50.4	
0.531	42.0	.....	.....	
0.563	42.0	.....	47.3	
0.594	42.0	.....	.....	
0.625	42.0	45.7	47.3	
0.688	42.0	.....	47.3	
0.750-1.000	41.0	43.1	44.6	
1.063	41.0	.....	43.1	
1.125-1.500	39.4	41.5	43.1	
1.563	38.9	.....	.....	
1.625	38.3	.....	41.5	
1.688-2.000	38.3	.....	.....	

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $15.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.00 per cwt. Traps and bend: list prices plus 45%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Strip, coils 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12 in., 21.75c; over 12 in., 21.75-22.25c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.50c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 66.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 55.00-62.00c; 25 to 99 lb 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval, 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb, 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c; 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11, more than 2000 lb $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 0 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy, 11.75; battery plates 5.75; linotype and stereotype 12.50; electrotype 10.75; mixed babbitt 13.75.

Zinc: Old zinc, 6.00-6.50; new die cast scrap, 6.00-6.50; old die cast scrap, 4.75-5.00.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 22	24.50	13.50	12.50	121.50	20.00	29.00	56.50	83.25
Oct. 21	24.50	13.50	12.50	121.50	20.00	29.00	56.50	83.25
Oct. 14-20	24.50	13.50	12.50	121.50	20.00	29.00	56.50	83.25
Oct. 8-13	24.50	14.50	13.50	121.50	20.00	29.00	56.50	83.25
Oct. 7	24.50	14.50	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Oct. 1-6	24.50	15.50	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Sept. Avg.	24.50	15.50	13.99	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.50	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	15.50	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	83.356
Oct. 1951 Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Oct. 1947 Avg.	23.50	14.525	10.00	80.00	15.00	33.00	33.00	71.375

NOTE: Copper, Electrolytic del. Conn. Valley. Lead, common grade del. St. Louis; Zinc, price western E. St. Louis. Tin, Straits del. New York. Aluminum primary ingots, 99% del.; Antimony, bulk, f.o.b. Laredo, Tex. Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Wire . . .

Wire Prices, Page 125

Boston — Consumers of heading wire placed all fourth quarter tickets, but some tonnage will go into January schedules. Demand for bed spring wire is active with some first quarter volume placed. Only on finer sizes are there frequent openings for fourth quarter.

Sheets, Strip . . .

Sheet and Strip Prices, Page 124 & 124

Cleveland—Sheetmakers are under pressure for shipments and there is little chance of any openings appearing in schedules the remainder of this year. For that matter, little new tonnage will be available in first quarter in view of the anticipated heavy carryover from fourth quarter. There is no indication in trade circles here of any change contemplated in first quarter schedules. Some consumers in this district expect to be pinched for supplies should production at the Lackawanna plant of Bethlehem Steel Co. be held up for long. Strike last week closed down the strip mill at that point.

Boston—High carbon narrow cold-rolled strip specialties, annealed and tempered, are slack. There are openings for fourth quarter. Lower carbon orders extend into January with most mills, but pressure for forward tonnage is lacking. Inventories of straight chromium stainless are substantial and some consumers normally using nickel stainless refuse to swing to that grade. Heavier volume is being placed by shops in the Gardner area for baby carriages and doll buggy assembly, mostly 2-inch and under. One leading supplier of cold-rolled sheets is booking first quarter orders and increasing allotments in some cases. There is considerable fence-building in anticipation of flat-rolled production at Morrisville, Pa.

New York—District consumers of hot and cold carbon sheets are pressing for tonnage. Despite high steel operating rates, they are not encouraged by the outlook for placing new steel orders for shipment in the first quarter, except where ratings are high. Some producers have indicated they will be able to accept a little more than a third of their first quarter production for non-defense requirements. Certain others say they may be able to supply 40 per cent. High grade silicon sheets are scarce.

Philadelphia—Some sheet producers doubt first quarter military set-asides will be fully absorbed, thus holding out the hope they may have a little more tonnage to offer non-defense consumers than currently indicated. They think, however, there will not be nearly enough tonnage to meet demands, especially in cold-rolled sheets.

Pittsburgh—Steady pressure exists for sheets, especially from appliance manufacturers who anticipate active first quarter business. Open space for first quarter is largely filled, and some fourth quarter carryover tickets may not get cashed.

Birmingham—Mills are behind on delivery of sheets. Pressure is slightly less than it was a few months ago. That, however, is not taken as any indication of better balance between supply and demand in this section for the reason sheet capacity is not sufficient to meet growing demands of miscellaneous users.

Los Angeles—Japanese galvanized sheets are moving freely at prices between mill and warehouse figures.

San Francisco—Severe shortage period is looked for in first quarter in hot-rolled sheets. Thereafter, forward pressure will be much easier.

Carryovers Get Preference

Washington—Fourth quarter non-military authorized controlled materials orders calling for delivery in January and February, 1953, will be given certain scheduling preferences during November and December, 1952. Under direction 16 to CMP Reg. 1, designed to assist producers in solving carryover problems, non-military allotments for fourth quarter, 1952, are valid for placement as ACM orders with producers for shipment in any month of fourth quarter and during January and February.

This means that all such orders placed with the mills within the 15-day period immediately preceding the beginning of lead time must be accepted and scheduled for delivery in preference to first quarter, 1953, orders. In other words, fourth quarter ACM orders must be scheduled for delivery in January or February, 1953, even if such action requires setting back the delivery of first quarter, 1953 orders to a later month.

Steel Bars . . .

Bar Prices, Page 123

Boston—Although most mills have scheduled bar distribution for first quarter, substantial tonnage of commercial requirements are unplaced and only military turnbacks will open space. In smaller sizes all military tonnage is not being taken, but larger bars are not expected to ease in this respect. Schedules will be reviewed Nov. 1 on openings for high directive tonnage. Carbon flats are in short supply and about the only grades in bar form relatively available are stainless and tool steel. Springfield armory is closing on 1275 tons of bar stock for forging.

New York—Some bar sellers have not yet advised customers what they can count on in the way of new tonnage for first quarter. They are waiting to see what they can do with fourth quarter tickets. Some believe their fourth quarter carryover will take all of January and February production. Cold-finished bar sellers are not able to utilize anywhere near all their facilities because of the shortage in hot stock. They are, however, making some commitments for first quarter. In hot and cold alloy bars most mills are solidly booked through February.

Pittsburgh—Bar supply remains tight, but the outlook is improved. Military set-asides are on a current basis, and heavy inroads are being made in carryovers.

Cleveland—Civilian goods manufacturers are going to be pinched for bars, especially large diameter stock, for months to come. Heavy set-aside on military account is cutting sharply into supplies and prospects are unpromising for any early change in conditions. Actually, the pinch is expected to hold at least through first half of 1953. Carryover from fourth quarter will be heavy. The overflow from first to second quarter also promises to be large. Supply is especially stringent in cold-finished bars, reflecting not only strong military demand but also shortage of hot-rolled material.

Los Angeles—Bar producers are catching up on demand. Cold-drawn bars in smaller sizes are in better supply. Orders of airframe manufacturers placed with subcontractors are tapering.

Seattle—Demand for reinforcing steel shows a seasonal drop but merchant bars continue active. Mills report order backlogs will carry into first quarter.

Semifinished Steel . . .

Semifinished Prices, Page 123

Buffalo—Production at Bethlehem Steel Co.'s Lackawanna plant was curtailed last week as a result of a strike by 1200 rolling mill workers. The plant employs 17,000. The last of seven blast furnaces and a strip mill were closed down Oct. 20, openhearth furnaces and bar mills having been closed down Oct. 19. The strike broke out Oct. 17 when the workers walked out protesting a reported plan of the company affecting piecework rates. The work stoppage violated a company-union no-strike agreement.

Cleveland—Republic Steel Corp. expects to add another new openhearth furnace to its active list here in the next few weeks. This will bring to four the number of new units added since last April.

Detroit—Steelmaking operations here last week were at 110 per cent of capacity. Great Lakes Steel Corp. is operating all 17 open hearths. Ford recently established two tonnage records. On Oct. 19 it tapped 5197 tons, bettering the previous 1-day record set last April by 447 tons. The company's production from electric furnaces also set a record at 4743 tons, 153 more than the previous high.

Tubular Goods . . .

Tubular Goods Prices, Page 127

New York—Under normal conditions there is usually a fall flurry in demand for merchant pipe in anticipation of winter heating and plumbing needs. By this time such demand would be about over. Today, however, because of the shortage of pipe there is not this seasonal swing in evidence. Distributors are taking as much pipe as they can get whenever they can get it.

Los Angeles—Pressure for pipe is increasing and mill supplies are trailing demand. Public utilities and municipalities have large pipeline projects pending. Richfield Oil Corp. will construct additional refinery facilities at its Wilmington plant costing $40 million. Completion is scheduled for June, 1954.

San Francisco—Kaiser Steel Corp. will begin deliveries in first quarter on an 88,000-ton order for 24-in. and 26-in. steel pipe received from Ebasco Services, Inc., agent for West Coast Pipeline Co. which will lay a crude oil line from Wink, Tex., to southern California. The order is to be entire-

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See next week's issue for announcement of STEEL's "Program for Management"

ly filled by the end of September, 1953. The pipe line will require 210,000 tons of steel pipe. Consolidated Western Steel Division, U. S. Steel Co. will furnish 40 per cent of the tonnage.

Plates . . .

Plate Prices, Page 124

New York—Boiler and tank fabricators hold fourth quarter plate tickets they can't get the mills to accept. Such promises as they have been able to obtain for first quarter indicate continued stringency. One fabricator of boiler tanks is far behind on commitments due to inability to obtain sufficient plate tonnage. Municipal demand is off due to extended deliveries and general uncertainties as to costs by the time tanks are fabricated and installed. Manufacturing requirements are leveling off also. Shipyard operations are adversely affected by stringency in plates.

Boston—Only improvement in plate procurement is on narrow, light gage sizes, 36-in. and under. Tank shops are hard pressed in most cases. Consumers are especially concerned over deliveries the next two months, mostly overdue tonnage. In first quarter, January-February schedules will include substantial volume of fourth quarter tickets. Not all volume carrying A to E ratings was placed for fourth quarter.

Philadelphia—Plate mills have little new tonnage to offer non-defense consumers for shipment before March. Some haven't opened their books for that month pending determination as to what tonnage they will have to offer.

Pittsburgh—No open space exists on mill books for first quarter. If production can keep ahead of military demand and satisfy other fourth quarter ticket holders, supply easing can be expected.

Birmingham—District plate producers have little tonnage to offer in the foreseeable future. As is the case with sheets, not much improvement in supply is anticipated through first quarter.

Seattle—Fabricators report activity is restricted by continued shortage of plates. One large shop recently imported 500 tons of Japanese plates, paying premium prices.

Tool Steel . . .

Tool Steel Prices, Page 125

Pittsburgh—Vanadium-Alloys Steel Co. is considering an addition to its rolling mill at Latrobe, Pa. Modernization to provide flexibility rather than increased capacity is planned.

An electric furnace under construction at Monaca, Pa., is expected to be in operation about Jan. 1. A new chemical and physical laboratory at Latrobe is completed and the company is making spectroscopic analyses for the eight elements commonly used in tool steels.

Long-range business outlook of the company is favorable. Its foreign sales are holding up. The company's Italian affiliate, Vanadium-Alloys Steel Societa Italiana, is well established and profitable operations appear assured. The company's operations in powder metallurgy are said to be on a profitable basis, no longer being in an experimental stage. New equipment has been added that will double the firm's present productive capacity.

Cleveland—Shipments of high-speed and tool steel have recovered sharply from the slowdown experienced during the period of the steel strike in June and July.

Movement to consumers, however, has not regained the tonnage level that prevailed prior to the strike, this being explained by the fact some consumers reportedly are working off stocks of moly-type material which they have been compelled to take under government regulations when specifying grades in scarcer supply.

Generally, current consumption is described as heavy although pressure for high-speed types is noticeably off.

Shipments of all grades of tool steel, exclusive of hollow drill steel, in August totaled 9818 net tons. This compares with 5615 in July, and with 10,287 tons in May prior to the steel strike. In August a year ago shipments totaled 15,351 net tons.

Cumulative shipments in the first eight months this year total 83,195 net tons. Shipments in the corresponding period of 1951 were 119,718 tons.

Chrome Ore . . .

New York—While foreign chrome ore prices are unchanged, the upward trend in ocean rates is likely to have a bearing before very long. Meanwhile demand is strong, with the government continuing to stockpile. There is relatively little domestic production which can be counted on.

Structural Shapes . . .

Structural Shape Prices, Page 123

Philadelphia—Due chiefly to governmental restrictions on commercial work, structural activity is spotty. Bridgework is the major sustaining factor. Fabricating shops, however, have substantial order backlogs. Most of the smaller shops have at least four months work on hand and certain large interests hold up to 16 months work on books.

Boston—With larger structural fabricating shops shipments are heavier than new bookings. Some inroads on backlogs result. Deliveries vary. Some shops can make March-April on medium tonnage contracts while others are extended to June on current orders. Tonnage up for estimates is smallest in two years. Bridge inquiry is light, but first contracts for a 7000-ton span, Tiverton, R. I., are expected late this year.

New York—While bids will be opened on substantial amount of state thruway bridge work at the end of this month, the structural market generally is dull. Over the next several weeks little outstanding is in prospect other than bridge work, due in part to governmental restrictions on commercial work and to uncertainty as to the cost trend.

Pittsburgh—Structural shape customers are not pressing for deliveries, but they are taking all the tonnage offered them.

San Francisco—Some fabricators are working only a three-day week because of the shortage of structurals.

Seattle—Major construction at the

Hanford plant, under general contract to the Kaiser Engineering Co., calls for 2000 tons of shapes. For The Dalles, Oreg., bridge, bids in, 1000 tons additional shapes will be required, part of the tonnage having been fabricated previously.

Iron Ore . . .

Iron Ore Prices, Page 129

Cleveland—Adverse weather conditions on the upper lakes are hampering iron ore shipments. Freezing temperatures have necessitated the steaming of ore at loading docks, thus delaying shipping, and many hours sailing time are being lost by gales on the lakes.

The shipping delays are reflected in a drop of 314,208 tons in the movement of ore from the head of the lakes in the week ended Oct. 20 to 2,826,898 tons. Cumulative shipments in the 1952 lake navigation season now stand at 60,187,171 gross tons, or 18,426,160 tons under the total at this time in the 1951 shipping season.

Lake Superior iron ore consumption by furnaces in the U. S. and Canada in September totaled 7,659,099 gross tons. This compares with 7,243,081 tons in August and with 7,472,777 in September a year ago. Cumulative consumption this year to the end of September totaled 54,176,197 gross tons against 66,356,687 in the like period of 1951.

Stocks of Lake Superior ore at furnaces and Lake Erie docks on Oct. 1 totaled 41,532,214 gross tons. This compares with 34,136,891 at the beginning of the preceding month, and 45,450,925 on Oct. 1 a year ago.

At the beginning of October there were 191 out of 199 blast furnaces using Lake Superior ore in blast. A month ago there were 185 active, and a year ago 188.

Pig Iron . . .

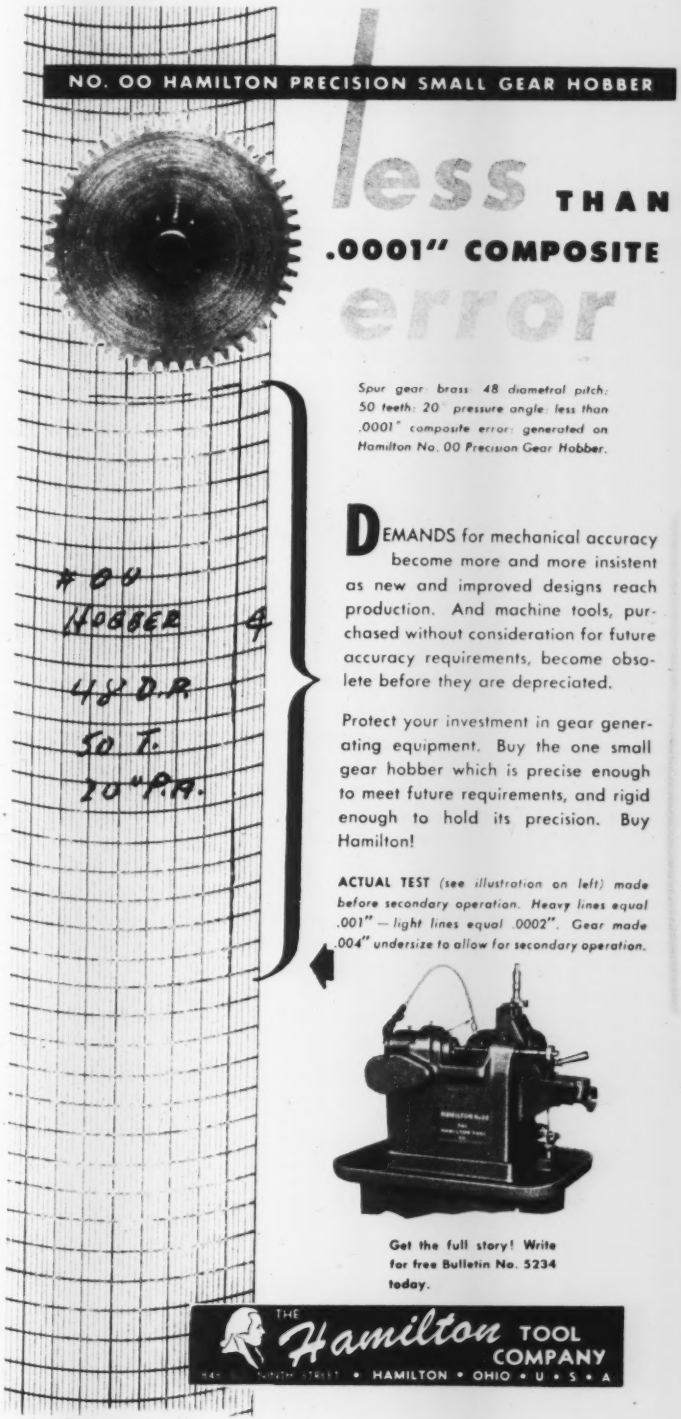
Pig Iron Prices, Page 122

Buffalo—Price cutting on gray iron castings is reported with the foundries actively seeking new business. Steel castings prices, however, show no signs of easing. Demand for pig iron from automotive sources continues brisk. Improvement is reported in railroad car supply which for a time hampered iron shipments from this district.

New York—It will be only a relatively short time before pig iron supply and demand will balance in this district. Gray iron foundry business is light and shops are not consuming as much as anticipated a few weeks ago. Sellers report inquiry exceeds supply but that the latter will get caught up fairly soon. Adding to the generally softer tone is a continuation of the AFL strike at several foundries in the Newark, N. J., area.

Philadelphia—Supply of foundry pig iron is approaching balance with demand. Lifting of the present 30-day limitation on inventories, however, would result in a buying spurt. The coal strike is causing no concern in view of heavy stocks above ground.

Cleveland—Although gray iron shops on light castings are not fully engaged pig iron demand continues strong, merchant sellers experiencing no difficulty in moving all of the



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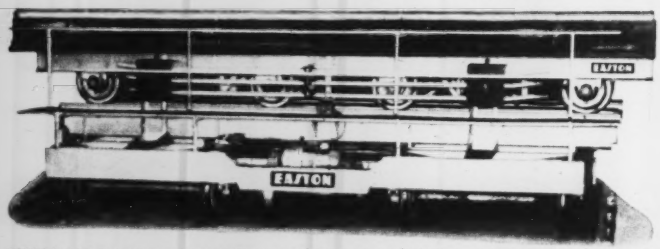

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tonnage produced. Government regulation holding consumer inventories to 30-days is thought to be holding back some demand. If removed, it is said, some foundries that are now getting only moderate tonnage would seek to enlarge their stocks. Republic Steel Corp. last week took off its No. 4 stack here for relining. The furnace will be idle several weeks leaving nine furnaces in the immediate Cleveland district in blast.

Birmingham—Looking into the future pig iron sellers are speculating on advent of considerable "free" iron probably by the middle of 1953.

Scrap . . .

Scrap Prices, Page 130

Detroit—Extremely high steel output here has reduced dealers' scrap stocks below normal and the mills are pressing for delivery of all grades. Foundries, generally, expect better business shortly but are not responding to lower price scrap offerings. Most of them are loaded with scrap, some being over-extended with inventory. Result is brokers' buying prices are as much as $4 under ceiling with demand limited.

Cleveland—High steelmaking operations, assured well into 1953, are expected to provide strong support to the scrap market over coming months. Mill stocks are comfortable, but before spring some inroads into stockpiles are anticipated with collections and preparation hampered by adverse winter weather. Yard stocks in this area are limited prompting the view some supply difficulties may be encountered should a severe winter be experienced. Prices on steelmaking grades hold at ceiling but prices continue soft on certain cast grades, reflecting sluggish operations at some foundries.

Chicago—Except for further lack of interest in cast grades, the scrap situation here remains unchanged. Steelmaking grades of industrial origin move in good volume under contract but mills are not inclined to acquire additional tonnage in view of heavy inventories. Intake of dealer offerings is limited. Blast furnace material is difficult to move. Foundry operations are spotty, many shops lacking order volume.

Boston—Cast scrap is weak on small volume. All grades are $7 to $8 under ceilings. Steel scrap is at ceiling with shipments steady. Yard shipments about equal those to consumers and most processors could use more light scrap for presses.

Buffalo—Stronger tendencies have crept into the scrap market following a softer tone which developed as result of a shortlived strike at Bethlehem Steel Co.'s Lackawanna plant. Termination of the strike encouraged dealers despite an extended embargo on shipments by another leading mill consumer. Mills' reserve stocks continue to build up. Strength in cast has failed to develop with new business going $2 to $3 per ton below ceiling.

Philadelphia—Dealers in steel scrap continue to ship tonnage about as fast as they get it in. Few yards have any stocks on hand, an unfavorable situation for this season. Industrial scrap is coming out more freely and more government offerings are noted without any attempt at allo-

cating them. Prices are strong except on cupola cast and unstrapped motor blocks which are nominally unchanged.

Pittsburgh—Scrap market is relatively quiet with most grades moving at ceiling. Freight car shortage has held up shipments by some dealers but mills have large stocks and operations have not been impaired.

Birmingham—Scrap movement continues brisk with a large portion of melting steel available here moving to out-of-state points. Moderate demand for cast grades is reported. Current yard receipts are below expectations.

Los Angeles—Mills are building comfortable steelmaking scrap inventories and demand is tapering. Overall collections are down 30 per cent.

San Francisco—Scrap supplies are adequate. Only change in the market the past week was a $1 per ton boost in No. 1 cupola cast to $44.

Seattle—The scrap situation is fairly satisfactory although current receipts are not heavy enough to fortify stockpiles against the coming winter. Ceiling price is being paid for heavy melting, but cast iron is off, $31 being quoted on unstripped motor blocks as against a ceiling of $43. Foundries are paying $41 for No. 1 cupola, and heavy breakable is quoted $36 to $38.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 127

Pittsburgh — Coal stockpiles are substantial, but it is too early to estimate the effect of the current coal strike. Most producers expect early return of the miners to their jobs.

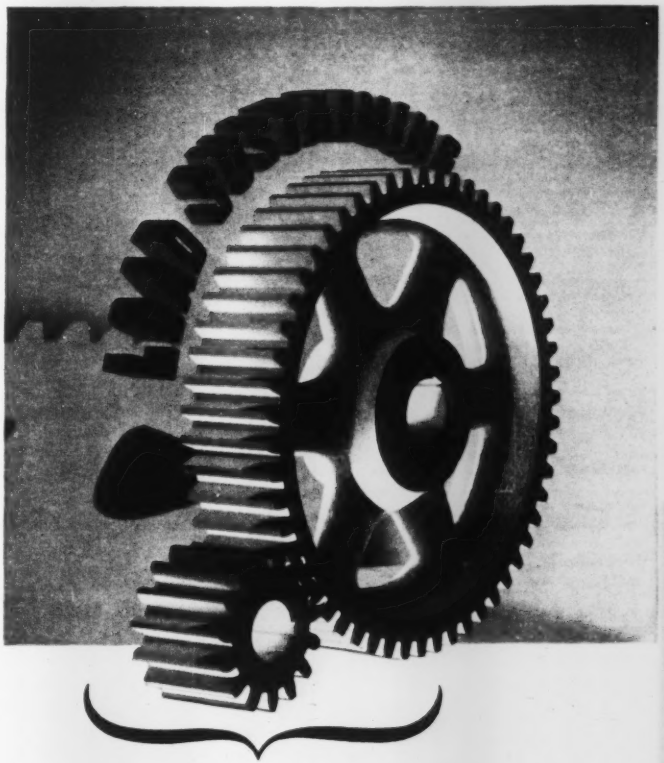
Warehouse . . .

Warehouse Prices, Page 129

Cleveland—Strong demand is encountered by the warehouses but with stocks unbalanced they are unable to satisfy all requirements. Consumers have to do considerable shopping around. While warehouse allotments call for 120 per cent of base period receipts, tonnage is not going to the distributors in that volume. This is for the simple reason some mills, on request to NPA, were permitted to cut their warehouse allotments of various scarce items. As a result, while warehouse stocks have improved over the past month or so, over-all balance is lacking. It will be second quarter before anything approaching balance is achieved, it is believed in the trade. Hope is expressed by distributors here that NPA shortly will remove the regulation stipulating that 50 per cent of incoming receipts from the mills be held for 15 days to care for possible defense demands. The freeze is unnecessary, it is maintained, and is hampering normal business activities. The matter was one of the chief topics for discussion at last week's meeting of the NPA industry advisory committee in Washington, the first held in well over a year.

Boston—Sales are geared to available stocks in standard carbon products with demand in excess of supply. Although varying with mill and product, warehouses lack balance in obtaining 120 per cent of base quotas.

Philadelphia—Indications are Octo-



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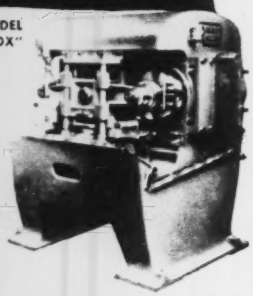

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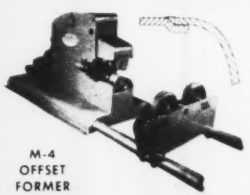

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ber volume of local steel distributors will equal that of September. Bars, shapes and plates continue in outstanding demand with warehouse receipts short of requirements.

Pittsburgh—Flow of steel to warehouses is substantial but lacks balance in sizes and grades. Heavy plates and wide flange beams are moving out of stock at an abnormal rate.

Birmingham—Warehouse sales are steady but limited in some specifications to availability of stocks. Distributors report little opportunity to accumulate inventories.

Los Angeles—Warehouse sales are active but orders are for smaller tonnage. Sales of light angles and channels, bars and plates to aircraft subcontractors are lighter.

San Francisco—The steel strike has had the effect of "washing out" one full three months' period as far as warehouse supplies of cold-finished bars, plates, structurals and hot-rolled sheets are concerned.

Seattle—Warehouses have revised their price lists, some items reflecting changes in zinc. Business generally has improved over September and demand continues strong on most items. Volume is limited by shortages, principally sheets and plates.

Canada . . .

Toronto, Ont.—A new code for grading scrap is in the making. New specifications are expected within two months. The new code, being worked out by dealers, steel mills and foundries, will generally revise trade specifications that have seen little change in the last 10 years. Some 27 different grades are proposed to be established for preparation to standard specifications by dealers based on mill and foundry requirements.

Toronto, Ont.—Canadian pig iron prices have been advanced $2.50 per ton with new prices as follows: Basic grade, $57; foundry iron, (2.25 to 2.75 silicon) $57, and malleable iron $58 per gross ton.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, land shaft, Manhattan side, in connection with expansion work on the Lincoln Tunnel, New York, to Bethlehem Steel Co.

1100 tons, fuel storage project, Harpswell Neck, Me., to United States Steel Co., Pittsburgh; Verrier Construction Co., Portland, Me., general contractor.

340 tons, state bridge work, Union county, New Jersey, through G. M. Brewster, general contractor, to Harris Structural Steel Co., New York.

175 tons, field house addition, University of Connecticut, Storrs, Conn., to City Iron Works, Hartford; Associated Construction Co., Hartford, general contractor.

125 tons, factory building, Hassall Mfg. Co., Jericho, Long Island, through Wininger Construction Corp., New York, to Dreier Structural Steel Co., Inc., Long Island City, N. Y.

350 tons, building, Central Penn National Bank, Philadelphia, to Cantley & Co., that city.

340 tons, state bridge, Ontario county, New York, through the Lane Construction Co., to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

2000 tons, expansion, Hanford, Wash., plant, bids in to Kaiser Engineering Co.

1325 tons, vertical lift bridge, Snohomish river, Snohomish county, Washington; bids Nov. 6, State Highway Commission, Olympia.

1000 tons, The Dalles, Ore., Columbia river bridge, Guy F. Atkinson Co., Portland, Ore., low $2,478,000.

615 tons, bridge, Housatonic river, New Milford, Conn.; Mariani Construction Co., New Haven, Conn., low; also 220 tons steel piles and 100 tons bars and mesh.

425 tons, state bridge, in connection with Garden state parkway development, Middlesex county, New Jersey, bids Nov. 6; also required are 45,000 linear feet of bearing piles which will be furnished by the Port of New York Authority.

250 tons, DuPont plant addition, Bell, W. Va., bids Oct. 27.

200 tons, approximately, Bird S. Coler Memorial Hospital building, Welfare Island, New York City, plans being figured.

200 tons, naval buildings, Whidbey Island, Wash., Strand & Son, Seattle, low $3,335,000.

100 tons plus, completion outlet works, etc., Lucky Peak dam, Idaho, Mitchell & Bruce Construction Co., Fort Worth, Tex., low $2,500,405, to U. S. Engineer, Walla Walla, Wash.

REINFORCING BARS . . .

REINFORCING BARS PLACED

285 tons, dormitories, Fairchild, Wash., air base, to Bethlehem Pacific Coast Steel Corp., Seattle; Bennett Campbell, Seattle, general contractor.

120 tons, St. Anne Hospital, Anaconda, Mont., to Northwest Steel Rolling Mills Inc., Seattle; J. C. Boespflug Construction Co., Seattle, general contractor.

REINFORCING BARS PENDING

775 tons, bridge and approaches, Snohomish river, Snohomish county, Washington; bids Nov. 6, state highway commission, Olympia.

740 tons, state bridge in connection with Garden state parkway development, Middlesex county, New Jersey, bids Nov. 6.

600 tons, Columbia river bridge, The Dalles, Ore., Guy F. Atkinson Co., Portland, Ore., low.

425 tons, piling, mesh and bars, state highway project, Vernon and Tolland, Conn., M. A. Gammino Construction Co., Providence, R. I., low.

400 tons, dormitories, mess hall, etc., Great Falls, Mont., air base, Lease & Legland, Seattle, low $1,652,678, to U. S. Engineer, also four alternates.

300 tons plus, addition to Virginia Mason Hospital, Seattle, and school structure, Bellevue, Wash., bids in.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Louisville & Nashville, 40 diesel units, 36 going to the Electro-Motive Division, General Motors Corp., La Grange, Ill., and 13 to American Locomotive-General Electric Companies, Schenectady, N. Y.

RAILROAD CARS PLACED

Chicago & North Western, 100 seventy-ton ore cars, to Bethlehem Steel Co.

Duluth, Missabe & Iron Range, 500 seventy-ton ore cars, to Pullman-Standard Car Mfg. Co., Chicago.

Lehigh Valley, 100 seventy-ton covered hopper cars, to Johnstown, Pa., plant of Bethlehem Steel Co.

Merchants Despatch Transportation Corp. and Northern Refrigerator Line, 1000 forty-ton refrigerator cars, placed jointly with the Merchants Despatch Shops, East Rochester, N. Y.

Missouri Pacific, one flat car and one well car, to its De Soto, Mo., shop.

Reading, one 245-ton flat car and one 125-ton flat car, to own shops.

Toledo, Peoria & Western, 50 fifty-ton box cars, divided equally between Pullman-Standard Car Mfg. Co., Chicago, and American Car & Foundry Co., New York.

Union Tank Car Co., 600 fifty-ton tank cars, to own shops.

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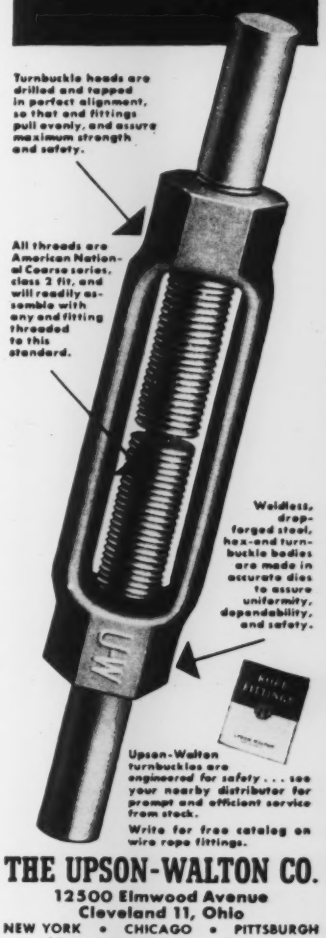

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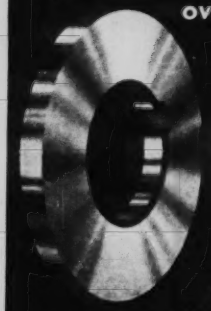

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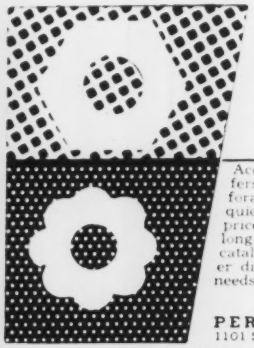

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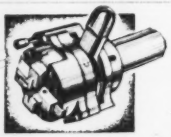

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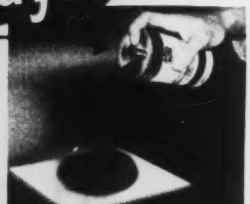

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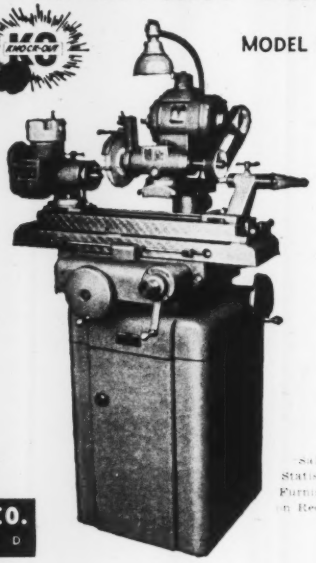

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Caterpillar Tractor Leases Plant

Caterpillar Tractor Co., Peoria, Ill., leased a warehouse and parts processing plant to be erected on land adjacent to the company's new plant site at York, Pa. Caterpillar's 600,000 sq ft manufacturing plant, now under construction, is scheduled to start into limited production about July, 1953, and to be completed by the end of that year.

Switch Gears To Be Made in Scranton

Federal Electric Products Co., Newark, N. J., will lease plant facilities in Scranton, Pa., for production of heavy power and transmission switch gears. The $1 million plant will be built by the Scranton Lackawanna Industrial Building Co. which is erecting structures to attract new industries to the area.

Permacast Equips Foundry Building

Permacast Co. equipped a 1000 sq ft foundry building at 610 William St., Baltimore, for production of permanent-type aluminum castings.

Associated Spring Gets New Division

Seaboard Coil Spring Corp., Los Angeles, is now a division of Associated Spring Corp., Bristol, Conn. Seaboard manufactures a wide variety of precision mechanical springs and wire forms.

Machine Tool Builder Names Agents

Lees-Bradner Co., Cleveland, manufacturer of hobbing and threading machinery, appointed as its dealers: Osborne Machinery Co., San Francisco; Swanson Machinery Co., Grand Rapids, Mich.; and Klatt & Co., Toledo, O.

Nuclear Laboratories Established

Walter Kidde Nuclear Laboratories, New York, is establishing new laboratory facilities at 975 Stewart Ave., Garden City, Long Island, to serve as headquarters for the firm's operations. This privately-financed research organization is devoted primarily to the development of atomic power for commercial and industrial purposes. Research operations will start Nov. 1, although installation of specialized equipment will continue for several months. Typical of the activities to be undertaken at the laboratory are: Corrosion studies in connection with liquid metals and under special conditions encountered in the atomic field; application of liquid metals as heat transfer elements; development and fabrication of special metals and alloys for jacketing reactor fuel elements; accumulation of original data in connection with such elements as bismuth, zirconium, beryllium, molybdenum, etc.

Triangle Steel Builds Warehouse

Triangle Steel & Supply Co., Los Angeles, started construction of a 22,000 sq ft warehouse building.

Roebling Moves Cleveland Warehouse

John A. Roebling's Sons Co., Trenton, N. J., moved its Cleveland offices and warehouse to 13225 Lakewood Heights Blvd., Cleveland 7.

Hewitt-Robins Inc. Opens Branches

Hewitt-Robins Inc., Stamford, Conn., opened new headquarters for its Western Division at 2533 Malt Ave., Los Angeles and for its South Central Division at 5711 Navigation Blvd., Houston. G. V. Migula is manager of the Western Division; L. C. Holloman, South Central Division.

H. Kramer & Co. Opens Smelter

H. Kramer & Co., Chicago, opened a brass and bronze ingot smelting plant at 631 S. Aviation Blvd., El Segundo, Calif. The plant includes a laboratory; two 66-ton reverberatory, two rotary type, and a number of tilting furnaces; and a cupola.

Porter Acquires Watson-Stillman

H. K. Porter Co. Inc., Pittsburgh, acquired Watson-Stillman Co., Roselle, N. J., manufacturer of forged steel fittings and hydraulic equipment. Operations at Watson-Stillman will continue under the direction of Elwin A. Stillman, president.

Diesel Engine Firm Changes Hands

Controlling interest in Hill Diesel Engine Corp., Lansing, Mich., was purchased by Melvin T. Berry, president, Barton Corp., West Bend, Wis. Mr. Berry acted as head of a syndicate in making the purchase from Drake America Corp., New York. Part of the diesel-engine manufacturing operations may be moved to Providence, R. I.

Barvue Mines Operates New Property

Barvue Mines Ltd., Barraute, Que., started production of zinc-silver concentrates at an initial rate of 1000 tons daily, with a minimum of 4000 tons a day planned by the end of the year. The property has been brought into production at a cost of about $7 million. From exploratory work done to date, ore reserves are estimated at

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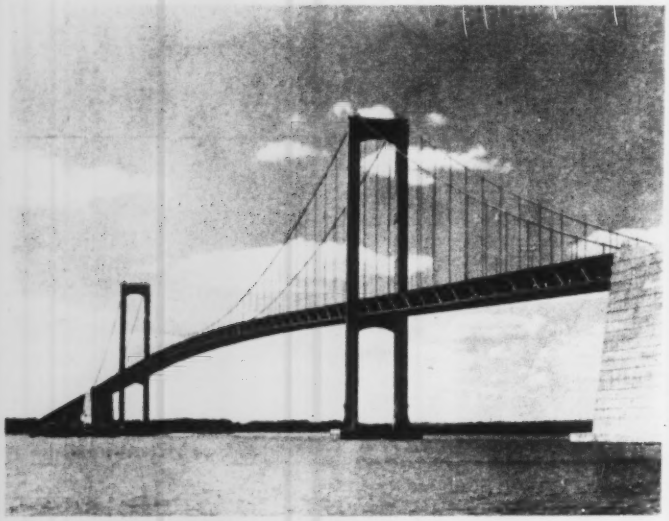


Delaware Memorial Bridge Wins Beauty Contest

The photograph above shows the Delaware Memorial Bridge, a recent winner of the American Institute of Steel Construction's award for the most beautiful bridge in its class. U. S. Steel Corp.'s American Bridge Division built the structure

7,650,000 long to a depth of 300 ft, grading 3.3 per cent zinc and 1.2 ounces of silver per ton. Barnyac Mines, through American Lead, Zinc & Refining Co., entered into a contract with a subsidiary of United States Steel Co. covering the sale of 175,000 tons of zinc concentrate at 17.5¢ U.S. per pound for zinc.

Heating Equipment Maker Builds

C. A. Dunham Co. Ltd., heating equipment manufacturer, is erecting a plant in Toronto, Ont. The project is scheduled for completion early next year.

Westinghouse To Move Department

Air Arms Division, Westinghouse Electric Corp., Pittsburgh, plans to move its engineering department from Lansdowne, Pa., to Friendship airport, Baltimore, in November. The entire 450,000 sq ft plant in Baltimore is expected to be in operation by the first of next year.

Home Appliance Maker Leases Plant

An additional manufacturing plant in Grayslake, Ill., was leased by Cory Corp., Chicago, manufacturer of home appliances. The company also announced its entrance into the volume manufacture and sale of electric home air conditioners and electric dehumidifiers for home, industrial and commercial use. Work will begin immediately in setting up proper machinery and equipment to swing into mass production of air conditioners and dehumidifiers at the Grayslake plant.

Cannon Electric Names Distributor

Stromberg Time Corp., subsidiary of General Time Corp., New York, manufacturer of employee time recorders, time stamps, clocks, program instruments, timers, job time recorders, etc., assumed the sales and distribution of signal equipment manufactured by Cannon Electric Co., Los Angeles.

Admiral Consolidates Operations

Admiral Corp., Chicago, consolidated all refrigerator production at its Midwest Mfg. Corp.'s plant in Galesburg, Ill. Heretofore, the company produced only its 11 and 12 cu ft refrigerators at that plant.

Kaiser To Expand Maryland Plant

Kaiser Aluminum & Chemical Corp., Oakland, Calif., plans to start work shortly on an addition to its plant in Halethorpe, Md. Cost of the project is estimated at $9 million. Equipment will include two presses weighing 1000 tons each. These presses will extrude aircraft parts from 3000-pound billets up to 100 feet in length and 2 feet in width. Work on these presses was started last spring and is expected to be completed before the end of 1953. Annual capacity of the Halethorpe plant is in excess of 56 million pounds.

Gordon Opens Manufacturing Plant

Claud S. Gordon Co., Chicago, opened its new manufacturing plant in Richmond, Ill. Machinery has been installed for the manufacture of thermocouples, pyrometer accessories and metallurgical testing machines. The new facilities include also a complete insulating mill for applying insulation to wire. Home office and headquarters for the engineering and service departments will remain at the Chicago plant at 3000 S. Wallace St.

Berkshire Buys Innis, Speiden & Co.

Berkshire Chemicals Inc., New York, manufacturer of mercurials, zirconium chemicals, carbamates, vanadium chemicals, boron and agricultural magnesia, purchased Innis, Speiden Inc., that city, distributor of heavy chemicals and white goods. The purchase of Innis, Speiden & Co. was made from International Minerals & Chemical Corp., Chicago, which has owned and operated the company as a division since 1950.

Brandt Tool & Die Co. Moves

Brandt Tool & Die Co., Baltimore, moved from 5241 Fairlawn Ave. to larger quarters at 5243 Fairlawn Ave.

Audio Tool Plans Toronto Plant

Audio Tool & Engineering Ltd. will erect a plant in Toronto, Ont., where it will consolidate all operations. The company will produce electric fans, ironers and record changers.

Rutley Industries Inc. Organized

Recognizing the increased need in metalworking plants for chemical compounds that are "tailored" to specific conditions, Charles A. Gerber and Arnold A. Tannenbaum organized Rutley Industries Inc., 115 Greenwich St., New York. In addition to consultation service and private production of special cleaning compounds, Rutley is manufacturing a line of preparations for welding and brazing.

Federal Products Opens Branch Office

Federal Products Corp., Providence, R. I., opened a branch sales office at 1018 Stuyvesant Ave., Union, N. J., to serve the Greater New York City area. The office is under management of James G. Gunderson.

McKee Opens Toronto Office

Arthur G. McKee & Co. of Canada Ltd., Toronto, subsidiary of Arthur G. McKee & Co., Cleveland, opened offices at 350 Bay St., Toronto, Ont. The company appointed Ralph A. Westervelt as vice president to direct operations of this office. The Canadian subsidiary, organized on July 2, 1952, will specialize in the design,

engineering and construction of petroleum processing facilities, blast furnaces, open-hearth shops, rolling mills, ore preparation and treating plants and related facilities.

Peerless Pump Appoints Distributor

Peerless Pump Division, Food Machinery & Chemical Corp., San Jose, Calif., appointed White Industrial Sales & Equipment Co., Cleveland, as its distributor in that area.

Die Supply Sales Co. Organized

Die Supply Sales Co., 311 Vermont Ave., Dayton, O., took over the sales and service responsibilities of Die Supply Co., formerly at 915 Valley St., that city. The new company continues under direction of W. F. Powell, sales manager, and G. T. Russell, office manager.

Bivans Corp. Expands Plant

Bivans Mfg., Los Angeles, designer and manufacturer of carton handling machinery, was incorporated as Bivans Corp. The firm added 2000 sq ft of production area and offices to the plant.

Syntron Office Opened in Birmingham

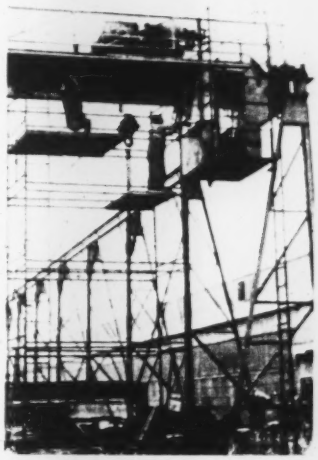
Syntron Birmingham Sales Co. opened offices at 1831 29th Ave. S., Birmingham. Sales operations are under the direction of A. H. Brush. This company handles vibratory materials handling equipment, portable power tools and other items manufactured by Syntron Co., Homer City, Pa.

Rheem Organizes Research Laboratory

Entire activity of Rheem Mfg. Co.'s new research and development laboratory, Whittier, Calif., will be concentrated on work for Rheem Aircraft Division plants in nearby Downey, Calif. Chemical, metallurgical, environmental, strength and fatigue testing equipment has been installed throughout the laboratory. Laurance A. Cooper, general manager of Rheem Aircraft Division, heads the research and development program.

Chrysler Plans West Coast Laboratory

A production control metallurgical laboratory will be established by Chrysler Corp., Detroit, at its Dodge San Leandro, Calif., plant to insure and improve the quality of airplane propellers which will be manufactured there. The laboratory will be under direction of Volney F. Landry, resident engineer at the plant, and A. T. Hanson, metallurgist. The San Leandro plant will be in production early in 1953 on the propeller in the plant addition, which also houses the laboratory. The new building also will be used to build passenger car bodies for the present Dodge San Leandro auto assembly plant. Over-all production will be under direction of Glen T. Johnson, general manager of the plant.



Scaffold Stresses Safety

At National Supply Co.'s Torrance, Calif., plant, this sectional steel scaffold cuts dangers of high-altitude repair work. The maintenance department of National Supply planned and built the scaffolding with movable platforms, a steel ladder and railings contributing to workers' safety. Made of tubular steel, it can be taken apart and re-erected whenever necessary.

Marshall Buys Engineering Research

Norton C. Marshall purchased stock and equipment of Engineering Research & Mfg. Co., Detroit. The company, designers and processors of aircraft and automotive special tools, dies, gages, jigs and fixtures, was owned formerly by Peninsular Distributing Co. Mr. Marshall is owner and president of Detroit Sheet Metal Works and the Norton C. Marshall Co., industrial designers and fabricators.

W. C. Dillon Moves to New Plant

W. C. Dillon & Co. Inc., manufacturer of test apparatus, moved its operations to 14620 Keswick St., Van Nuys, Calif.

Chase Reorganizes Research Program

Chase Brass & Copper Co. Inc., Waterbury, Conn., reorganized its research activities to be included in a new research and development department under direction of Dr. D. K. Crampton. The department was formed to meet the need for increased and more fundamental research on copper, titanium and other metals. Reorganized metallurgical departments are under the direction of B. H. McGar at the Waterbury mill and R. E. Ricksecker at Cleveland.

Arthur Colton Co. Names Agent

Arthur Colton Co., Detroit, specialists in pharmaceutical and packaging machinery, appointed Warren Curry Co., Atlanta, as its representative.

CIMCO SELECT MACHINE TOOLS GUARANTEED

Niles 36-44 Vertical Boring Mill.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, late type.
LeBlond #2½ Univ. Miller, 3 SCD.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Landis 10x18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Ledge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¾" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning 20" swing, 2¼" hole in spindle, 54" centers.
Ledge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 15', 4 SCD, 12" center distance, Loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Liberty 36" x 36" x 18" Double Housing Planer, 2 rail and 2 side heads.
Ledge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
American 36" x 40' Lathe, Internal Face Plate Drive, with 4" raising blocks, 33" center distance.
Pond 42 x 42 x 10' Double Housing Planer, DC motor drive, 4 heads.
Pond 84 x 84 x 16' Double Housing Planer, DC motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
Geo. Otis Shear 3/16 x 10' capacity, motorized with 10 HP motor.
Cincinnati-Bickford 4'11" column Radial drill, gear box on base.
Cincinnati #2 Vertical Mill, H. Speed.
Jones Hydraulic Bender, 1½" capacity.
Peerless 6 x 6 Universal Shaping Saw.

SURPLUS MACHINERY

Cincinnati Machinery Company Incorporated
207 E SECOND STREET
CINCINNATI 2, OHIO

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 40-Ton Capacity
Box, Single Sheathed, 50-Ton
Flats 40 and 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite, or All Steel, 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, *Cross Dump*
Hoppers, All-Steel, 70-Ton, *Cross Dump*
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton Drop Door
End Dump, 10-Yd., 30-Ton Lift Door

OTHER EQUIPMENT

Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

1500 H.P., 120-Ton, Type 0-4-4-0

Send us your inquiries **WE BUY FREIGHT CARS FOR DISMANTLING** ***Send us your offerings***

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REPAIR PARTS For All Types of Freight Cars

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50-D. Church Street
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Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

FOR SALE
GARDNER VERTICAL DISC GRINDER

WINSTON MACHINERY CO., INC.
[illegible] West Ohio St. Indianapolis 2, Ind.

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ⅝" PL
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

STEEL SALESMAN WANTED

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Write Box 591, STEEL
Penton Bldg. Cleveland 13, Ohio

ROLL TURNER

Wanted Roll Turner—Experienced on bar mill and special shapes. Please reply to

Box 579, STEEL,
Penton Bldg., Cleveland 13, Ohio

Wanted

FORGING SUPERVISOR

Experienced in operation of Board Drop Hammers 800 to 3000 lb. size and related equipment. Excellent opportunity with well established firm. Please state qualifications in detail.

Write Box 591, STEEL,
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED ADVERTISING

Help Wanted

WAREHOUSE MANAGER

Industrial steel warehouse located in Southwest seeking manager experienced in all phases of warehouse operation. Write Box 581, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST

Recent graduate wanted by Pittsburgh bar and tubing fabricator. Laboratory and processing control and metallurgical contact involved. Good future for one with initiative. Give age, education, experience and salary expected. Our personnel know of this advertisement. Write Box 590, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST—Sales experience familiar with stainless steel pipe and tubing. Thorough knowledge of process piping system in chemical plants required by large Eastern Distributor. Some traveling necessary in Eastern States. Write stating age, qualifications, salary etc. Reply Box 593, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED: PRODUCTION SUPERINTENDENT FOR STRUCTURAL STEEL DIVISION of old established fabricating company, Detroit area—one who is thoroughly experienced in all phases of structural steel fabrication. Must be capable of taking full charge of structural steel production. Only those with full knowledge and experience will be considered. All replies will be held confidential. Should be between 35-45 years of age. Excellent opportunity for the right man. Write Box 590, STEEL, Penton Bldg., Cleveland 13, Ohio.

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FOR USED TRANSFORMERS

Convert your used transformers to cash! Send us a description of them TODAY.
TRANSFORMERS AND COILS BUILT TO YOUR SPECIFICATIONS.
Send blueprints for prompt quotation.
TRANSFORMERS BOUGHT, SOLD AND REPAIRED
40 Years of Dependable Service

THE ELECTRIC SERVICE CO.
5315 Hetzel St., Cincinnati 27, Ohio

Positions Wanted

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 589, STEEL, Penton Bldg., Cleveland 13, Ohio.

Opportunities

For Sale or Investment
Small Cutting Tool Business

A small business engaged in the manufacture of special machine knives, having the necessary machines, tools, patterns and dies is available for sale. This line of tools would be a good addition to an established tool company. We are interested either in selling as a unit or in securing additional capital to further develop this line. Write Box 592, STEEL, Penton Bldg., Cleveland 13, Ohio.

Accounts Wanted

ACCOUNTS WANTED

Do you need sales representation in Baltimore and its environs? Qualified manufacturers agent with 16 years experience successfully contacting structural and sheet metal fabricators and miscellaneous industrial accounts. Write Box 584, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, minimum 50 words, $12.50, each additional word .25; all capitals, minimum 50 words $16.00, each additional word .32; all capitals leaded, minimum 50 words $19.50, each additional word .39. "Positions Wanted" set solid, minimum 25 words, $3.00, each additional word .12; all capitals, minimum 25 words $3.75, each additional word .15; all capitals, leaded, minimum 25 words $4.50, each additional word .18. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. These rates are subject to 15 per cent agency commission and 2 per cent cash discount ten days. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Bldg., Cleveland 13, Ohio.

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STAINLESS STEEL

COMPLETE STOCK OF STAINLESS STEEL

BARS - SHEETS - PLATES

SAME DAY SHIPMENT FROM STOCK—ONE POUND OR A CARLOAD

We Specialize in Stainless Steel Only - Additional Items Arriving Daily

STAINLESS SHEETS

GAUGE	SIZE	PCS	TYPE
18	36" X 120"	24	304
18	36" X 96"	2	316
16	36" X 120"	40	316
16	42" X 120"	1	316
16	36" X 96"	1	316
16	42" X 144"	1	316
16	29" X 120"	1	316
16	30" X 120"	1	316
16	36" X 120"	2	316
16	48" X 120"	2	316
14	36" X 120"	10	316
14	48" X 120"	2	316
14	42" X 120"	1	316
14	29" X 120"	1	316
14	30" X 120"	1	316
14	42" X 144"	1	316
12	36" X 120"	1	316
12	48" X 120"	1	316
12	60" X 240"	1	316
12	48" X 240"	1	316
12	28" X 120"	1	316
12	36" X 142"	1	316
12	48" X 136"	1	321
11	24" X 144"	1	304
11	36" X 120"	1	304
11	42" X 124"	1	304
11	48" X 136"	1	304
11	48" X 148"	1	304
11	48" X 120"	2	316
11	36" X 72"	1	321
11	36" X 120"	1	321
11	28" X 120"	2	347
11	28" X 96"	1	347
10	36" X 96"	24	304
10	24" X 100"	2	304
10	42" X 136"	1	304
10	24" X 144"	1	304
10	27" X 114"	1	304
10	30" X 132"	1	304
10	23" X 132"	1	304
10	48" X 144"	1	304
10	27" X 108"	1	304
10	27" X 106"	1	304
10	24" X 112"	1	304
10	25" X 144"	1	304
10	24" X 120"	1	304
10	32" X 136"	1	347
9	60" X 144"	1	304
9	36" X 144"	1	304
9	32" X 108"	1	304
9	25" X 132"	1	304
9	26" X 120"	2	304
9	26" X 120"	1	347
9	26" X 40"	1	347
9	26" X 100"	1	347

STAINLESS ROUND BARS

TYPE 303

DIAMETER	WEIGHT
3/16"	500 lbs
1/4"	920 lbs

STAINLESS ROUND BARS

TYPE 303

DIAMETER	WEIGHT
1/2"	500 lbs
5/8"	225 lbs
7/8"	317 lbs
1"	201 lbs
1 1/4"	1,000 lbs
1 3/4"	978 lbs
1 7/8"	23 lbs
2"	23 lbs
2 1/2"	12,000 lbs
3"	414 lbs
3 1/2"	210 lbs
3 1/2"	1,400 lbs
3 1/2"	2,984 lbs
3 15/16"	2,400 lbs
4"	219 lbs

TYPE 304

1/2"	200 lbs
1 3/16"	1,000 lbs
1 1/2"	200 lbs
3 1/4"	920 lbs

TYPE 309

9/16"	900 lbs

TYPE 321

1"	10,000 lbs

TYPE 347

3/4"	1,092 lbs
1 1/16"	200 lbs
1 21/64"	1,210 lbs

STAINLESS HEXAGON BARS

TYPE 303

1 1/2"	437 lbs
3/4"	225 lbs

TYPE 347

1 3/4"	336 lbs
3/8"	63 lbs

STAINLESS TUBING

TYPE 304

OD	WALL	QUANTITY
1 1/4"	120	360 ft
1 1/2"	16 GA	110 ft

STAINLESS PLATES

GAUGE	SIZE	PCS	TYPE
1/4"	36" X 60"	2	321
1/4"	36" X 108"	1	321

STAINLESS PLATES

GAUGE	SIZE	PCS	TYPE
1/4"	36" X 112"	1	321
1/4"	36" X 132"	1	321
3/16"	36" X 96"	1	321
3/16"	36" X 120"	1	321
3/16"	36" X 132"	1	321
3/16"	36" X 114"	1	321
3/16"	36" X 144"	1	321
3/16"	36" X 108"	1	321
3/16"	24" X 72"	1	316
3/16"	24" X 84"	1	316
3/16"	24" X 96"	1	316
3/16"	24" X 108"	1	316
3/16"	24" X 120"	1	316
3/16"	24" X 144"	1	316
3/16"	60" X 144"	1	316
3/16"	60" X 240"	1	316
3/16"	24" X 96"	1	316
3/16"	60" X 204"	1	316
3/16"	24" X 84"	1	321
3/16"	24" X 96"	1	321
3/16"	42" X 96"	1	321
3/16"	42" X 120"	1	321
3/16"	22" X 96"	1	347
3/16"	23" X 60"	1	347
3/16"	44" X 48"	1	347
3/16"	20" X 84"	2	347
1/4"	36" X 132"	2	304
1/4"	36" X 96"	1	304
1/4"	60" X 117"	1	304
1/4"	36" X 120"	1	321
1/4"	31" X 100"	1	347
1/4"	33" X 96"	1	347
1/4"	33" X 110"	1	347
1/4"	33" X 114"	1	347
1/4"	33" X 120"	1	347
1/4"	33" X 144"	1	347
1/4"	28" X 42"	1	347
1/4"	34" X 42"	1	347
1/4"	36" X 42"	1	347
1/4"	36" X 283"	1	304
1/4"	36" X 104"	1	321
1/4"	36" X 132"	2	321
1/4"	36" X 114"	1	321
1/4"	36" X 96"	1	321
1/4"	27" X 120"	1	321
1/4"	27" X 132"	1	321
1/4"	36" X 84"	1	321
1/4"	14" X 132"	1	321
1/4"	32" X 120"	1	321
1/4"	31" X 120"	1	321
1/4"	36" X 96"	1	321
1/4"	36" X 237"	1	304
1/4"	36" X 266"	1	304
1/4"	36" X 255"	1	304
1/4"	36" X 288"	1	304
1/4"	36" X 264"	1	304
1/4"	36" X 250"	1	304
1/4"	36" X 266"	1	304
1/4"	36" X 281"	1	304
1/4"	36" X 284"	1	304
1/4"	36" X 255"	1	304
1/4"	36" X 250"	1	304
1/4"	36" X 252"	1	304

STAINLESS PLATES

GAUGE	SIZE	PCS	TYPE
1/4"	36" X 256"	1	304
1/4"	24" X 260"	1	304
1/4"	24" X 288"	1	304
1/4"	30" X 36"	1	304
1/4"	24" X 120"	1	304
1/4"	48" X 129"	1	316
1/4"	20" X 60"	1	347
1/4"	36" X 108"	1	347
1/4"	30" X 120"	1	347
1/4"	42" X 126"	1	347
3/8"	24" X 24"	1	321
3/8"	24" X 41"	1	347
3/8"	30" X 120"	1	321
3/8"	36" X 114"	1	321
3/8"	18" X 48"	1	304
3/8"	24" X 30"	1	304
3/8"	24" X 48"	1	304
3/8"	11" X 132"	1	321
3/8"	30" X 112"	1	321
3/8"	30" X 114"	1	321
3/8"	10" X 114"	1	321
3/8"	21" X 48"	2	304
3/8"	24" X 42"	1	304
3/8"	24" X 56"	1	304
3/8"	24" X 132"	1	304
7/16"	24" X 42"	1	304
7/16"	21" X 96"	1	304
7/16"	20" X 42"	1	304
7/16"	20" X 42"	1	304
1/2"	24" X 42"	1	304
1/2"	24" X 120"	1	304
1/2"	24" X 144"	1	304
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1/2"	22" X 20"	1	304
1/2"	26" X 26"	1	304
1/2"	22" X 20"	1	304
1/2"	22" X 42"	1	304
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1/2"	24" X 42"	1	304
1/2"	24" X 48"	1	304
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1/2"	26" X 26"	1	304
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1/2"	20" X 42"	1	304
1/2"	18" X 36"	1	304
1/2"	20" X 60"	1	316
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1/2"	16" X 144"	2	304
1/2"	14" X 132"	1	304
1/2"	14" X 96"	1	304
1/2"	13" X 108"	1	304
1/2"	13" X 144"	1	304
1/2"	13" X 168"	1	304
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1/2"	21" X 84"	2	304
1/2"	20" X 42"	1	316
1/2"	20" X 42"	1	304
1/2"	20" X 42"	1	304
1/2"	20" X 24"	1	304

JANDRU *Steel Corporation*

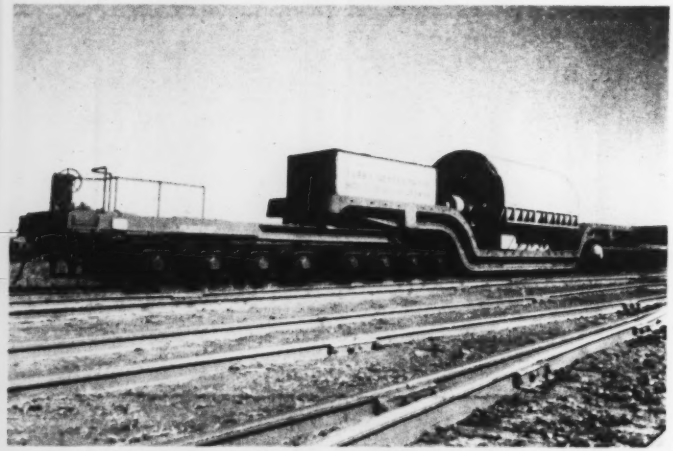
Executive Offices: 131 BRUCKNER BOULEVARD, NEW YORK 54, N. Y.

Telephone: CYpress 2-5617

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1865
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.



Heavyweight Flat Car Carries 250 Tons

This flat car designed by Pennsylvania Railroad engineers at their Altoona, Pa., works is among the largest freight cars ever built. Heavy industrial units and machinery weighing as much as 250 tons will ride on the 124-foot length of the car. It runs on 32 wheels arranged in four 8-wheel roller-bearing trucks. Above, the car carries a completely assembled turbo-generator unit weighing 215 tons

Macklin Incorporates Subsidiaries

Macklin Co., Jackson, Mich., organized Macklin Sales Co. as a subsidiary to handle all sales of grinding wheels and other abrasive products which it manufactures. At the same time, the company incorporated Macklin Abrasive Co., also a wholly owned subsidiary, to manufacture and sell abrasives to the trade.

Chase Brass Builds in Chicago

Chase Brass & Copper Co., Waterbury, Conn., is erecting a building at 5401 Grand Ave., Chicago, to house its branch offices and warehouse.

National Supply Expands in South

National Supply Co., Pittsburgh, constructed a larger oil field supply store at Harvey, La. H. K. McFann is manager of the store; L. A. J. Monroe, district manager.

Ideco To Export Hall-Scott Engines

Ideco Division, Dresser Equipment Co., Dallas, was appointed by Hall-Scott Motor Division, ACF-Brill Motors Co., Philadelphia, as exclusive export sales representative for Hall-Scott industrial engines. Ideco manufactures a complete line of drilling, servicing and production equipment for the petroleum industry.

Clark Equipment Appoints Dealers

Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich., appointed as its authorized dealers: Dempster Bros. Inc., Knoxville, Tenn.; EquipCo Inc., Miami, Fla.; Industrial Truck & Caster Co. Inc., New Orleans; Furnival Machinery Co., Philadelphia; Hull Equipment Co., Union, N. J.; and Rushmore, Weber & Case Inc., Albany, N. Y.

Segal Lock Buys Arrow Lock Corp.

Segal Lock & Hardware Co. Inc., New York, purchased Arrow Lock Corp., manufacturer of cylindrical, tubular and other locks for light construction. The firm also is engaged in defense production of metal items related to the hardware and lock field. Operations will be continued in the Arrow factory in Brooklyn, N. Y.

KSM Products Moves to New Plant

KSM Products Inc. moved to its new plant located on the outskirts of Merchantville, N. J. The company makes solid-fluxed welding studs and stud welding equipment.

Murray Corp. Appoints Distributor

Murray Corp. of America, Detroit, appointed Ohio Valley Hardware & Roofing Co., Evansville, Ind., as distributor for Murray steel kitchens and gas and electric ranges.

Bridgeport Brass Opens Warehouse

Bridgeport Brass Co., Bridgeport, Conn., opened a warehouse at 918 E. Lycoming St., Philadelphia. Operations are in charge of David F. Snow, district sales manager.

Union Metal Builds Canadian Plant

Union Metal Mfg. Co., Canton, O., completed plans for a branch manufacturing plant in Brampton, Ont. Construction is under way.

See next week's issue for announcement of STEEL's "Program for Management"

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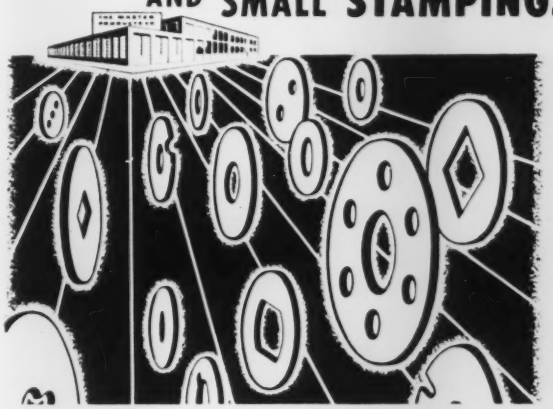
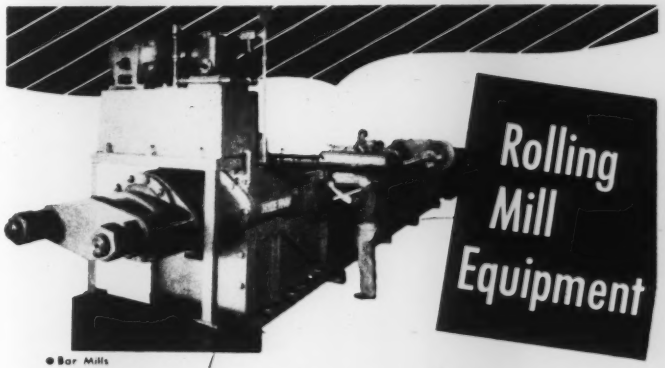
STANDARD AND SPECIAL WASHERS AND SMALL STAMPINGS



More than 30 years of experience in designing and producing Special Washers and Small Stampings . . . more than 12,000 sets of tools at your disposal. Any metal . . . any quantity. *Your inquiries will receive prompt and careful attention.*

THE MASTER PRODUCTS CO.

6400 Park Avenue Cleveland 5, Ohio



Rolling Mill Equipment

- Bar Mills
- Merchant Mills
- Sheet and Strip Mills
- Pinion Stands
- Roller Tables
- Reduction Drives
- Stretcher Levellers
- Guillotine Shears
- Sheet Mill Shears
- Roll Lathes
- Special Machinery
- Machine Work

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.

RED CIRCLE Rolls ALLOY-CHILLED

Hyde Park

FOUNDRY & MACHINE CO.

Hyde Park, Westmoreland County, Pa.

ROLLS • ROLLING MILL MACHINERY • GREY IRON CASTINGS

National Metal

LEADING SPECIALISTS IN

COLD ROLL FORMING

SINCE 1902

Announce

THE AVAILABILITY OF A PORTION OF OUR MODERN FACILITIES FOR D.O. PRODUCTION

Our broad metal forming experience covers shapes that can be fabricated by Cold Rolling steel, bronze, aluminum, stainless steel.

Comprehensive statement of our available capacity at your request. With requests for specific quotations, please include your blue print.

National Metal
PRODUCTS CO.
1025 CHATEAU ST.
PITTSBURGH 33, PA.

NATIONAL METAL PRODUCTS COMPANY

Since 1902 Since 1902

Manufacturers of

• Zinc and Bronze Weatherstripping • Stampings • Metal Frame Screens • Special Rolled Mouldings • Bronze and Aluminum Thresholds • Aluminum Awnings • Window Guard Units for Mobile Machine Shop • Zinc Products • Quonset Hut Window Units • Industrial Polishing.

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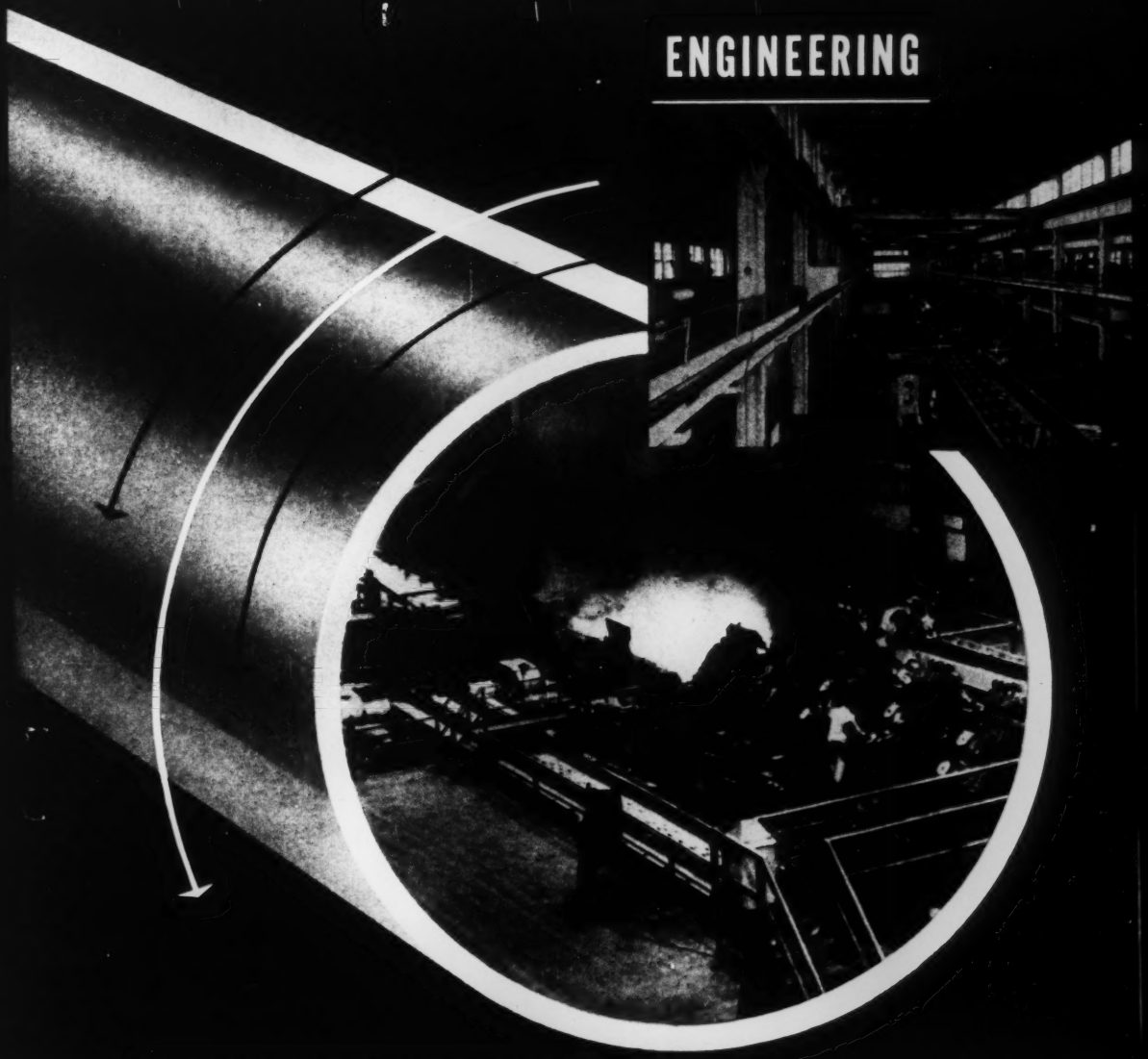


SEAMLESS TUBE MILLS

Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio · Ellwood City, P[illegible]vania

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England—Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y.—Mexico, Central and South America.

Societe de Constructions de Montbard, Paris, France—France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany—Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy—Italy.

Aetna Japan Company, Ltd., Tokyo, Japan—Japan.

Hale & Kulligren, Inc., Akron, Ohio—Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

Guillotine shear chops costs with TIMKEN® bearings carrying the shock loads

BUILT to stand up under grueling 24-hour operation in a steel mill, this Type 59 flying shear, built by The Hallden Machine Company, uses a total of 115 Timken® tapered roller bearings. They're in the main drive and roll drive boxes, on the main shear shaft, and on the back eccentric cam shaft.

Timken bearings withstand the terrific repetitive shock loads imposed on them by the levelling and cutting operations. Maintenance and repair costs are cut, costly breakdowns are prevented, accuracy is insured.

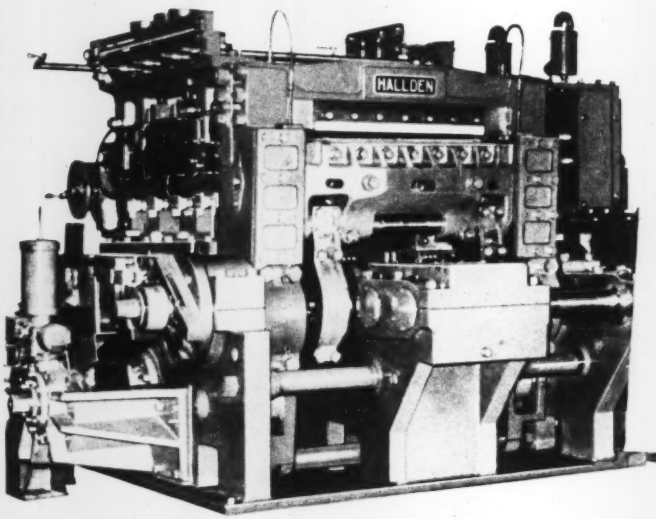
Due to their tapered construction, Timken bearings carry both radial and thrust loads in any combination. They take the heavy thrust loads of pinions and gears in the flying shear, keep them meshing accurately with minimum wear.

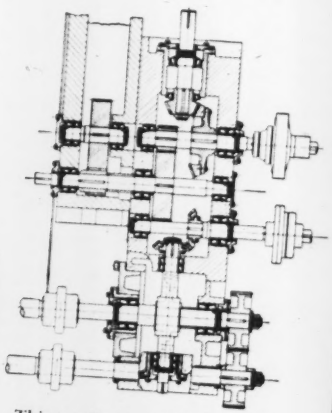
Maximum bearing capacity to carry the load of the shearing operation is provided in a minimum space because of the line contact between Timken bearing rollers and races.

Timken bearings reduce friction because they have true rolling motion and incredibly smooth surface finish. By keeping shafts and housings concentric, they make closures more effective; lubricant is kept in, dirt kept out. As a result, maintenance time is cut.

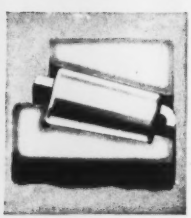
No other bearing can offer all the advantages of Timken bearings. Be sure to specify them for the machines you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.





This application is typical of the way **THE HALLDEN MACHINE COMPANY** mounts gears and shafts of its flying shears on Timken tapered roller bearings.



GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION